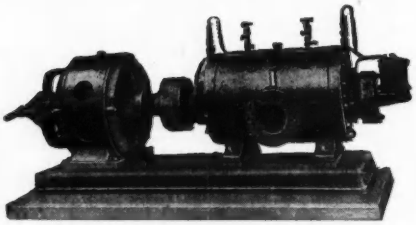
THE CHEMICAL AGE

VOL LVII 30 AUGUST 1947 No 1468



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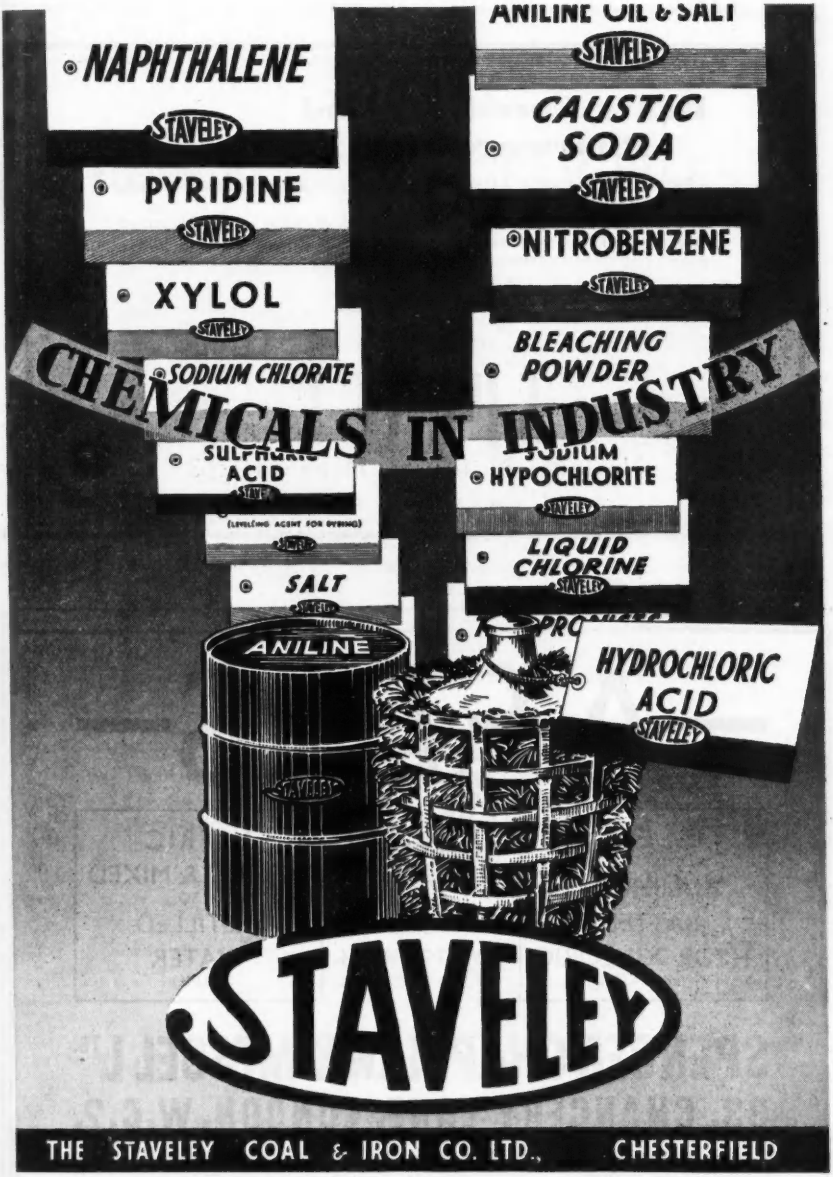
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The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

BOUVERIE HOUSE, 154 FLEET STREET, LONDON, E.C.4

Telegrams: ALLANGAS FLEET LONDON Telephone CENTRAL 3212 (12 lines)

SCOTTISH OFFICE: 116 Hope Street, Glasgow (Central 3970)

MIDLANDS OFFICE. Daimler House, Paradise Street. Birmingham (Midland 0784-5)

THE CHEMICAL AGE offices are closed on Saturdays in accordance with the adoption of the five-day week by Benn Brothers Limited

VOL. LVII No. 1468. 30 August 1947 Annual Subscription 26s. 8d. per copy; post free, 10d.

A Mighty Plan

THE Government has been loudly acclaimed as one composed exclusively and essentially of planners. It would naturally be expected that they would meet the undoubted emergency that existed when they took office—an emergency that grows more urgent with every day that passes—with a comprehensive and clear-cut plan. It is essential, moreover, that any plan that may exist should be explained to those who must put it into effect. The simplest form of plan is that which says to industry: "This and this is the position; we want exports, get on with the job and come to us for any help you may need." That is perhaps hardly a plan, it is the organisation of industry to meet the threat of national bankruptcy. It would pre-suppose that industry should be allowed a reasonable profit on its undertakings and given a free hand to do whatever is needed to achieve the objective. That was not the "plan" that the Government adopted.

The plan, if it can be called such, appears to be the direct antithesis of that one. It said in effect: "This and this is the position; we shall control every movement you make; we shall tell you what to do; we shall tell everyone in the country what to do; do nothing unless we tell you to do it; and if you make any profits we shall take them." To put such a "plan" into effect requires a totalitarian state; and this we have not yet achieved. But it may come later. It certainly requires some very experienced business man at the head of every Government department and a Cabinet composed of those with vast experience in industrial affairs. Since that is singularly lacking, the result is that so far as we can discern there is no "plan." There is concentration on the nationalisation of certain basic industries. There is a general insistence that we must tighten our belts till it hurts and export everything that we need for ourselves. But is that a "plan"? What we see (with apologies to Pope) is "a mighty maze, but quite without a plan."

Our present difficulties are essentially economic. They are caused through loss of our overseas investments during and between the two German wars so that those invisible exports upon which we relied so largely to keep our Budget straight have disappeared into thin air in a modern rake's progress that was none of our choosing. The simple problem, the "this and this" which we have quoted earlier in this discussion, is to recover our financial stability in a world confused and rendered poor by the destruction of war. That is a problem for bankers, economists, and above all for sound "hard-headed" business men. Since the solution of the problem depends wholly on industry, industry should either have been told clearly what policy to adopt, or left to work out a policy for itself and for the nation in collaboration with the Government. But we read in a recent issue of the National Union of Manufacturers' Journal: "If orderly progress towards the economic recovery of Britain is to be made, there must now be reached a clear understanding as to the place which the private sector is to occupy in our industrial life and the conditions under which it is to be allowed to carry out its very heavy responsibilities. The National Union is inundated with requests for enlightenment and guidance in the bewilderment and frustration which surrounds most of those who endeavour to respond to the Government's exhortation to produce

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more goods from the limited available supplies of labour, raw materials and fuel. . . . The present outlook is a fog of doubt and uncertainty. . . . How, in such a welter of uncertainty, is the manufacturer to quote firm prices and delivery dates?"

There are important signs that we are already reaching the end of the sellers' market. The N.U.M. journal records that the sellers' market is already so far reduced that such important matters as ability to quote firm prices and delivery dates are coming into operation as important factors in obtaining export business. Other nations are able to make these promises under penalty; British manufacturers in general are not. Some foreign buyers are accepting a clause which states that the British manufacturer is only under penalty if the delay is under circumstances which are not within his control. Other foreign buyers, however, are already insisting on definitive dates and fixed prices under penalty—and our North American competitors are agreeing to these terms. Control, which should have enabled us to do all these things, has only succeeded in making uncertainty still more uncertain.

Some of the industries of this country are very large. There are a few firms of the size and calibre of Imperial Chemical Industries. There are the great steel firms, the Central Electricity Board, the railways, great gas undertakings and so forth. But too often the Government appears to legislate only for these very large undertakings. Some two-thirds of British industry, however, is composed of small firms and this applies to the chemical industry as much as to any other. The small firm, no less than the large undertaking, exists for the purpose of making profits, but all British firms of standing accept the principle that the first duty of industry is a service to the community and that industrial concerns exist only by virtue of their ability to give this service. Under the present system of Government control from the centre there are approximately two million Civil Servants, *i.e.*, 10 per cent of the working population is non-productive. It has been computed that on a full count of State servants —the armed Forces, police, fire service and professional people—each twenty people otherwise employed must carry two Service members, half a munition worker, and four Civil Servants; *i.e.*, each three producers must carry one non-producer, an arrangement which obviously increases taxation considerably and therefore increases cost.

There can be no question but that there must be reached immediately a clear understanding of the function of privately-operated enterprise and of the facilities which will be afforded to enable it to operate efficiently. The N.U.M. has no doubt as to how industry can be enabled to play the part which it is necessary that it should play if the economic stability of the nation is not to collapse. Here, in the words of the N.U.M. Journal is the answer: " A stop should be put to the persecution of private enterprise; encouragement should be given to initiative, energy and good management, industry should be consulted before plans are made and principles irrevocably decided; full information should be given regarding the future operation of nationalised services which will provide a complete stranglehold on the private sector and the incidence of taxation should be changed to give encouragement to efforts made to help the country to recover its economic health."

NOTES AND COMMENTS

Depressing Figures

THE figures of coal won from the ground in July cannot be called exactly encouraging. With 20,000 more workers on the books than in July last year, there was each week an average of 160,000 tons less. It is true that much of this loss can be attributed to recognised holidays—and for that reason alone we fear there will be an even worse showing for August, the traditional holiday month. Apart from the question of holidays, there must be internal evils in the coal-mining industry which are holding back coal production. One of these evils is the practice of still having private enterprise carrying on within a nationalised industry. Normally we are fervant upholders of private enterprise. But this particular bit of private enterprise is something which has been long condemned both by owners and some miners themselves, although we fear strikes if there is any attempt to stop this practice. What we have in mind is the system of contracting, whereby instead of a man working for a specified wage (or rate) in a given capacity, he accepts contracts. These contracts, say to produce so many tons of coal, remove so much rock, lay so many yards of road (rails) or to repair machinery, provide for the payment of an agreed sum for the work. They permit the contractor to engage the services of fellow workers (the management concurring, of course). The workers engaged on these contracts are paid by the contractor a fixed sum to do fixed work. Whether they take six or eight hours over the job, the amount is fixed beforehand. Obviously experienced men will not accept a job which will not repay them well. Usually they finish the job with time in hand and are then able to walk out of the pit. Other workers, seeing them finish work and thinking they may have earned more by fewer hours of work, become dissatisfied with their own hours and wages.

The Contract System

ARGUMENTS in favour of this contract system are that there is some incentive given to the workers in that they can earn more money by working harder. They can finish their jobs, too, in quicker time if they "go to it" and can then down tools and go home. They are not tied to the pit for a certain number of hours. These workers usually have more leisure time than those not working on these contracts. Against this must be set the dissatisfaction felt among non-contract workers. There is further the waste of time spent in haggling over the amount to be paid and the work to be done for each contract. This may seem a small item, but hours literally are wasted in some pits over this haggling. A last point is that some contractors are not as impartial as colliery officials should be, and allot the better jobs to their pet cronies to the disgust and dissatisfaction of men who are given the more arduous or less remunerative work. This contract system is recognised by the unions: there are minimum wage levels for men working for contractors. If the Coal Board tries to get rid of this system they will have a series of strikes on their hands. But, we think, it is not the best system for harmonious working nor does it get sufficient coal. Even if the coal mining industry reaches the target of 200,000,000 tons this year, the chemical industry, according to the estimates of Imperial Chemical Industries, will be able to work only to 85 per cent of their full capacity. To help get as much coal as possible, all restrictive practices—and the contract system must count as such—should come to an end. By this means the target may be exceeded and the chemical and other industries be able to go full out for exports.

Quotas Not Met

HOW does the present reduced output affect the chemical industry? In the first place it seems that fuel quotas—much reduced from the normal pre-crisis quotas—are not being met. In these circumstances it is proving an almost impossible job for some firms to put aside enough coal for a three weeks' supply for the winter, which is what Mr. Shinwell demands. If it is absolutely necessary for firms to have this reserve of coal, then the least that the Fuel Ministry can do is to keep to the fuel quota which was worked out, we presume, in the knowledge of all the present and future factors. In this connection we wonder, incidentally, why Mr. Shinwell is so insistent on this reserve being built up. Is there going to be a coal-less three weeks some

time during the winter, or is he afraid that transport, which showed the severe strain last winter, may collapse altogether during this coming cold weather? However, despite the Government's failure to maintain the fuel quota, some firms in the N.W. are well on the way to building up their coal reserves. Many have done this by their foresight in changing partially from coal-burning to oil-burning. We hope that in September, with holidays out of the way, more coal will be forthcoming and the chemical industry will be able more easily to provide reserves of fuel for the winter.

More Headaches

BUT, urgent though this coal problem is, it is not the only headache for the chemical industry at the moment. The problem of staggering hours so as to reduce peak-loads of electricity, and even electricity-less days has to be faced. Many chemical processes are continuous and the working hours of their staffs are already staggered. It may be that some processes, *e.g.*, drying, may at present be concentrated into certain hours of the day, and could, perhaps, be moved over to periods when there was less demand from others for electricity. But where a chemical manufacturer is surrounded by firms in other industries, it will not be as easy for him as for them to say if and when he should have a day without electric current. The district committees which are working out which days the districts shall be cut off must bear in mind that many chemical manufacturers cannot face with equanimity the prospect of having power cut off for a day each week. Makers of other goods could just stand off their men, but the chemical manufacturer in many cases will stand to lose money and materials. Because of this, some firms have provided themselves with generating plant. Two firms whose chairmen have recently announced their purchase of oil-burning generating plant are Catalin, Ltd., and Dufay-Chromex, Ltd. But as the Government has now put a ban on the conversion of coal-burning to oil-burning plant, we presume oil-burning generating plant, too, will come under this stoppage, and no more firms will be able to make themselves independent of electricity cuts.

Better Figures

CHEMICAL trading statistics for July, details of which are given elsewhere, show a marked increase in the value of chemicals exported during the month. From the June figure of £5,581,832, exports of chemicals, dyes, drugs and colours, rose to £7,170,454 during July (compared with a monthly average of £1,856,649 during 1938). For all chemicals, including oils, waxes, soap, etc., there was an increased export value of £1,480,736. On the other side there was a slight increase in the value of imported chemicals from £2,329,278 in June to £2,447,407 in July, but, including oil, waxes, soap, etc., there was a bigger increase—from £9,046,252 to £10,983,132. Among chemicals, of which the import increased considerably is carbon black (75,260 cwt. in July against 42,486 cwt. in June), potassium compounds (798,474 cwt. in July, 704,159 cwt. in June), essential oils (541,415 lb. in July, 293,202 lb. in June), and paraffin wax (46,455 cwt. in July, 21,927 cwt. in June). Against these were increased exports of ammonium sulphate (38,553 tons : 17,108 tons), cresylic acid (240,333 gal. : 188,118 gal.), tar oil and other heavy coal-tar oils (9,302,061 gal. : 3,300,276 gal.), sulphate of copper (4583 tons : 2555 tons), caustic soda (178,519 cwt. : 99,443 cwt.), and sodium carbonate including soda ash (233,935 cwt. : 185,713 cwt.).

Chemical Chiefs on Trial

THE trial opened at Nuremburg this week of 27 former directors and high-ranking officials of the German I.G. Farbenindustrie trust. The court is presided over by four American judges and among the party of experts summoned from this country is Lord Wright, chairman of the United Nations War Crimes Commission. The indictment, running to 72 printed pages, alleges that the accused "committed crimes against peace, war crimes,and crimes against humanity, and participated in a common plan or conspiracy to commit the said crimes." The chiefs of the accused, Buettefisch and Gattineau, are alleged to have contacted Hitler in 1932 and secured Nazi party support for their plans for synthetic petrol production and to have developed secret armament works in 1933.

It is also alleged that Farben had cartel arrangements, sales agreements and other associations with hundreds of foreign firms, including the Standard Oil Co., New Jersey, and the American Dow Chemical Co.

U.K. Chemical Trading in July

Export and Import Figures

STATISTICS contained in the Trade and Navigation Accounts of the U.K. for July continue to show many marked differences compared with the same period last year and with June this year.

Among imports, acids rose fairly sharply compared with June, boric and tartaric even exceeding the monthly average for 1938. Calcium carbide, however, dropped heavily compared with June and was but a fraction of the average 1938 figure. Under potassium compounds considerably less caustic and lyes arrived in this country, though potassium chloride supplies showed a marked increase, while nitrate imports ceased altogether. Ethyl alcohol, of which none was imported in July, 1946, arrived to the tune of 1½ million proof gallons. An interesting feature of synthetic dyestuff supplies is that they are now being received in appreciable quantities from Germany (more, in fact, than from all other foreign sources combined), whereas a year ago, when Switzerland was the main supplier, Germany sent us none at all. Lithopone, of which none is being imported, in 1938 arrived at a monthly average rate of 24,875 cwt.

On the export side of the balance sheet, ammonium compounds have continued to be exported at a greater monthly rate than in 1938, the figures for July being substantially larger than those for June, though much less than those for July, 1946. On a smaller scale—and with less marked differences between the respective figures—the same can be said of calcium carbide.

Tar oil exports, which had been maintained at a level roughly corresponding to those of 1938, suddenly soared last month to over 9 million gallons, *i.e.*, more than three times the average monthly figure for 1938, the June (1947) figure being rather less than 3 million gallons. Disinfectants, insecticides, etc., exported during July amounted to more than double the average monthly total for 1938, though they were reduced in quantity by nearly 25 per cent compared with July, 1946. The June (1947) figure shows that the July total is a step in the direction of reaching the rather higher 1946 figures. Salt exports, despite of a good June figure, dropped last month to 11,846 tons, which is not much more than half the average amount sent abroad in 1938. The totals for sodium carbonate and caustic soda, though considerably less than those of July, 1946, show an advance on the June (1947) figures. Quinine and quinine salts exports during July were almost exactly double the monthly average for 1938. Finished coal tar dyestuffs continued greatly to exceed 1938 figures.

CHEMICAL EXPORTS

	July, 1947	July, 1946.
	Cwt.	Cwt
Citric acid	316	2,089
Formic acid	1,749	1,662
Tartaric acid	579	602
	Tons	Tons
Aluminium oxide	437	38
Sulphate of alumina	2,348	2,234
All other kinds	345	510
Ammonium compounds	38,553	50,448
Nitrate	709	11,075
	Cwt.	Cwt.
Bleaching powder	46,374	95,323
Calcium carbide	2,616	23,084
	Gal.	Gal.
Benzol	6,853	40,538
Cresylic acid	240,333	272,628
Tar oils	9,302,061	298,650
	Tons	Tons
Copper sulphate	4,583	4,819
	Cwt.	Cwt.
Disinfectants, etc.	63,986	83,313
Glycerine	1,401	8,429
Lead acetate, litharge, red lead, etc.	3,039	3,119
	Gal.	Gal.
Tetraethyl lead	106,171	—
	Cwt.	Cwt.
Nickel salts	8,686	4,893
Potassium compounds	7,830	12,432
	Tons	Tons
Salt	11,846	16,245
	Cwt.	Cwt.
Sodium carbonate	233,935	452,552
Caustic soda	178,519	285,112
Chromate and bichromate	81	5,157
Synthetic nitrate	21	10,599
Silicate (waterglass)	9,114	17,277
	Oz.	Oz.
Quinine and its salts	262,106	173,194
	Mega Units	Mega Units
Penicillin	3.004	2,801
	Cwt.	Cwt.
Coal-tar dyestuffs	18,397	16,917
Extracts for tanning	13,930	15,928
Earth colours	19,106	20,999
Lithopone	10,088	12,732
White lead	594	1,665
Soap (excluding toilet, shaving and abrasive)	23,898	18,358
Paraffin wax	6,080	7
Total* value of chemical manufactures	£ 7,921,105	£ 7,246,024

CHEMICAL IMPORTS

	July, 1947	July, 1946
	Cwt.	Cwt.
Acetic acid	7,992	1,696
Boric acid	6,400	1,660
Tartaric acid	4,000	1,200
All other kinds of acid	3,261	103
	Tons	Tons
Ammonium phosphate	3,300	2,700
	Cwt.	Cwt.
Borax	14,800	9,740
Calcium carbide	1,670	1,964
Glycerine	156	24
	Lb.	Lb.
Iodine	59,569	59,571
	Cwt.	Cwt.
Caustic and lyes	744	6,021
Potassium chloride	798,474	198,398
Potassium nitrate	—	1,975
Potassium sulphate	30,480	1,640
All other potassium compounds	1,276	1,276
Sodium nitrate	19,940	72,381
	Pf. Gal.	Pf. Gal.
Ethyl alcohol	1,584,400	—
	Oz.	Oz.

(*Continued overleaf*)

Allocations of Tin Metal

THE Ministry of Supply announces that the Combined Tin Committee has made a further interim allocation of tin metal for the second half of 1947 amounting to 15,710 tons. This allocation is in addition to a first interim allocation of 11,331 announced on July 8 (THE CHEMICAL AGE, July 12, 1947). Together these total 27,041 tons and represent nearly all the tin that can be expected to be available during the remainder of 1947. Although the committee may be able to allocate small additional quantities later in the year, it must be understood that the present allocations will have to cover to a substantial degree the needs of the consumer-countries for this period. The allocations to individual countries are shown below.

	Interim Allocation	New Allocation	Total Allocation to Date
	(long tons)		
Australia	103	172	275
Austria	22	75	97
Canada	300	700	1000
Czechoslovakia	161	347	508
Denmark	119	46	165
Finland	35	15	50
France	1515	2600	4115
Hungary	—	203	203
India	525	2738	3263
New Zealand	42	125	167
Norway	90	51	141
Poland	239	2	241
Sweden	293	200	493
Switzerland	225	297	522
Turkey	90	96	186
United States	6750	7907	14657
Uruguay	25	16	41
Others	797(a)	120(b)	917
	11331	15710	27041

(a) To countries not receiving an interim allocation on August 21st.
(b) For small allotments to miscellaneous Latin American and Middle East countries which do not submit requirements directly to the Committee.

The committee wishes to emphasise once more that tin metal supplies available are sufficient to meet only a little more than half the requirements of importing countries for consumption during the period. Although tin production is increasing, normal supply conditions are not expected to prevail for some time to come. It has not been possible to make new allocations to certain countries at this time either because satisfactory statistical information has not yet been presented to the committee or because purchases in excess of previous allocations have off-set the quantities to which they would otherwise have been entitled.

Supplies may be obtained from the following sources: The United Kingdom, on behalf of Malaya and Hong Kong, the Netherlands, Belgium, China, Siam and the United States, for stocks of Japanese tin. In addition, small demands of certain Latin American and Middle Eastern countries may be met from British, Belgian, Dutch and United States sources. September 30, 1947, is the latest date for applications to buy Japanese stocks.

Detailed information as regards procurement may be obtained from the Secretaries of the Combined Tin Committee or from the Directorate of Non-Ferrous Metals, 20 Albert Street, Rugby.

(*Continued from page* 285)

Quinine and its salts	371,197 Lb.	17,652 Lb.
Menthol	16,425 Cwt.	7,183 Cwt.
Synthetic organic dyestuffs ...	1,810	262
Carbon blacks	75,260	63,198
Lithopone	— Lb.	— Lb.
Essential oils	541,415 Cwt.	564,265 Cwt.
Turpentine	4,126	5,880
Paraffin wax	46,455 £	56,790 £
Total* value of chemical imports	10,983,132	8,234,520

* *including some commodities not listed here.*

German Cellulose Wool Products.—Yeast and cellulose wool are being produced by the Kurmärkische Zellwolle and Zellulose A.G., Wittenberge, which is now owned by the State. The firm has recently taken up the manufacture of albumen, carbon disulphide and cottonwool. A new plant at present under construction is intended to produce 1000 kg. of cellulose wool a day. At present 1800 people are employed.

R.I.C. Examination

An examination for the Associateship of the Royal Institute of Chemistry of Great Britain and Ireland is to be held in London during the week commencing Monday, January 19, 1948. Candidates not yet accepted should obtain a form of application from the Registrar without delay, so as to leave ample time to secure thereon the necessary signatures certifying that they have complied with the Regulations concerning their courses of training. The completed application forms must reach the Institute not later than Monday, October 13. No application in respect of the January examination will be considered if received later than that date.

Entry forms will be sent as soon as they are ready to all candidates who have been previously accepted and to those whose applications have been received as above. The last date for the receipt of entry forms will be Monday, November 17, after which no entry can be accepted.

International Progress in Plastics

Developments Reported at the XIth International Congress

SINCE the last Congress held in Rome in 1930, work in the plastics field has shown steady progress and achievements. This work, which went on in the various countries during the war, attained a considerable measure of success in spite of the many difficulties. Many of the papers presented at the International Congress showed the progress in this field. Among the papers presented in Section 11 (Chemistry in Relation to Elastomers, Plastics, Glass and Ceramics) the following abstracts may be quoted:

Plastics Progress, 1939-1940

By N. N. T. SAMARAS and R. J. SCHATZ

(Plastics Division, Monsanto Chemical Co., Springfield, Mass, U.S.A.).

Although by 1939 the United States of America had achieved world plastics leadership, producing 250 million lb. of intermediates valued at 50 million dollars, the real growth occurred during the next seven years. Production increased 500 per cent in this period—a phenomenal expansion exceeded only by that of synthetic rubber and magnesium.

A dozen plastics materials grew from pilot plant experimentation to large scale production. Polyvinyls, of negligible volume in 1939, were exceeded in tonnage in 1946 only by alkyds and phenolics, and on a dollar basis were virtually equal. Polystyrene, spurred when the monomer became available *via* the synthetic rubber programme, ranked sixth by 1946 and may be second by 1949. Nine new polymers arrived on the commercial scene—silicones, polytetrafluorethylene, and melamines being among the most notable chemically. Innumerable new end-uses have appeared. Paper and textile treatment, adhesives, wire-coating and other miscellaneous applications to-day consume greater tonnage than moulding.

Chief factors in plastics progress are: (1) the youth of the industry; (2) wide range of properties; (3) war-time acceleration; (4) vigorous research; (5) concurrent development of fabricating machinery; (6) standardisation of tests; (7) bonding with wood, paper, cloth, glass, etc.; (8) price reduction; (9) relative abundance of raw materials; (10) profit-making ability. A prediction of continued growth is based on: (1) development of copolymers and blends; (2) mechanical alteration—*i.e.*, orientation and stretching; (3) innovations in mass production techniques; (4) greater supplies of phenol, phthalic anhydride and plasticisers; and (5) pioneering research in silicon, sulphur, phosphorus and nitrogen types.

The Possibility of Hydroxyl Reaction in Phenolic Resin Formation

By DR. C. A. REDFARN

A brief résumé was given of the early theories of Baekeland and others on the structure of hardened one stage phenol-formaldehyde resins (resites), indicating how the early structural theories postulated reaction of the phenolic hydroxyl groups to give either linkages: later investigators (Koebner, Megson, Weith) tended to the view that phenols are reactive towards formaldehyde only in the 0.0′ and *p* positions. This view, coupled with the Functionality Theory, predicts that phenol, *m*-cresol, 1 : 3 : 5-xylene 01 and resorcinol give thermoset resins, and *o*-cresol, *p*-cresol, 1 : 2 : 5-xylenol, 1 : 3 :4-xylenol and 1 : 2 : 3-xylenol give permanently thermoplastic resins.

The author reported the production of thermoset resins from *o*-cresol, *p*-cresol, *p*-seloroxylenol and hemimellitenol, and tentatively a thermoplastic resin from prehnitenol.

From this and the reported failure of liagomethane to methylate resite, it is suggested that in some unspecified manner the phenolic hydroxyl group enters into the cross-linking reaction in resite formation.

The Crystallisation of High Polymers and Its Effect on Their Mechanical Properties

By GEOFFREY GEE

Polymers differ from substances of low molecular weight in that they are never wholly crystalline. Crystallisation of a polymer consists in the fitting together into a regular lattice of portions of adjacent molecules, leaving inevitably some regions which are unable to achieve the necessary order. The ratio of crystalline to amorphous in a polymer is thus likely to depend not only on the external conditions but also on the history of the particular specimen considered. The concept of an equilibrium between two phases is therefore of very limited value. The thermo-dynamic description of the system is discussed, and a physical interpretation given of the melting range of a polymer and its dependence on the conditions of crystallisation.

It is now widely accepted that the tensile strength of an elastic polymer is closely related to its ability to crystallise. The hypothesis is advanced that the tensile strengths of a series of chemically similar polymers are determined by the extent to which they crystallise before breaking. Experimental data are recorded for a series of vulcanised natural rubbers. Systematic variations

were made in the degree of cross linking, using several types of compound. The effect of swelling samples to varying extents in mineral oil was also studied. No quantitative estimate has been made of the extents of crystallisation obtained, but the results are in complete qualitative agreement with the hypothesis.

Plasticiser Action and Chemical Constitution

By D. FAULKNER

The investigation had as its object the determination of the influence of plasticiser constitution on the plasticisation of polyvinyl chloride; this embraced the study of several methods of assessing plasticiser efficiency, *viz.*, the use of intrinsic viscosity value as an expression of solvent power, determination of equilibrium swelling, determination of the precipitability of polymer solutions, and plots of the load-extension characteristics of plasticised compositions.

The plasticisers used comprised (1) esters of constant molecular weight derived from aliphatic dibasic acids; (2) esters of phthalic acid. With the first series, satisfactory qualitative correlation between the result given by the above methods was obtained, a maximum in the values of solvent power being observed. Chain-branching in the plasticiser molecule reduced the solvent power. With the second series, correlation between the four methods was less satisfactory. The viscosity and swelling methods gave slightly different positions of maximum solvent power, while the mechanical tests could not be interpreted on the basis of solvent power alone.

The application of certain thermodynamic relations to the results obtained in swelling measurements is discussed.

Dissolving, Swelling and Plasticising of Polymers

By R. HOUWINK, Delft (Holland)

The difference between internal and external plasticising were discussed. Softening is considered to be a more adequate expression than plasticising, since it also covers the phenomena of elasticising. For external softening it is necessary that the softener enters into the polymer, leading to swelling.

The laws controlling the conditions for swelling are similar to those controlling the phenomena of dissolving and of permeation. The final result is dependent on the changes of free energy and thus on the magnitudes of the entropy increase possible, in relation with the changes in internal energy.

Two types of swelling are to be distinguished, namely, that of limited and that of unlimited swelling. The limited swelling observed in practice depends not only on the possibilities of interlinking, as is often found in literature, but also on the combinations of intermolecular forces involved.

For studying limited swelling, these quantities should be calculated per monomer group and not as an integral quantity for the material bulk.

New Chemical Plant

Catarole Process Scheme

MESSRS. Petrocarbon, Ltd., inform us that our Home News Item "New Oil Plant" is not quite accurate. They explain that the plant at Partington, Cheshire, is being constructed by Petrochemicals, Ltd., under the control of Petrocarbon, Ltd. It is not to be a new oil refinery, but a plant to operate the Catarole process for the production of chemicals from petroleum.

Partington Industrial Estates, Ltd. (a wholly-owned subsidiary of Petrochemicals, Ltd.), have acquired a freehold site of about 771 acres, of which approximately 120 acres are being used for the Catarole project. It is intended that the remainder of the land should provide space for the construction of plant and factories by users of the basic raw materials which Petrochemicals, Ltd., will be producing.

Construction was started in October, 1946, and, in spite of the fuel crisis and the restrictions in steel supply, it has been possible, by means of re-deployment of labour and alternative construction methods, to draw up a programme which corresponds to the original construction schedule. Ground preparation for the Catarole plant, in particular all underground work, has been completed and foundation work for the main units is in progress. Cooling water intake pipes and main drainage have been laid. Work on the main cooling water pumphouse is at an advanced stage. Electrical substations have been erected and transformers installed. The first permanent buildings are now being erected. The foundations for the main storage tanks have been laid and erection has begun. Three-quarters of the fuel oil, naphtha and gas lines have been welded up and laid. Production is expected to start in mid-1948.

Austria's Penicillin Output..—The Biochemie G.m.b.H., a firm controlled by a Austrian Brewery concern, is reported to have invested some 5 million schillings in the manufacture of penicillin, in which the company appears to have a monopoly. Plans are in hand to commence large-scale manufacture of penicillin, with equipment to be bought in France.

American Chemical Notebook

From Our New York Correspondent

DOW Chemical Company's fiftieth annual report to stockholders reveals that consolidated sales reached the record figure of $130,426,838 during the fiscal year ended May 31. This was 28 per cent above the sales attained during the previous year and approximately 4½ per cent above the wartime peak of $124,570,200 during the fiscal year 1944-45. The company's net earnings were equivalent to $9.22 per share on the 1,248,706 shares of common stock after deducting $1,215,476 paid in preferred stock dividends. In his letter to the stockholders, Dr. Willard H. Dow, president, stated that despite the fact that the year brought the first major strikes in the company's history, one at the Texas division and one in the government-owned styrene plant at Los Angeles, he now felt relations with the company's 14,000 employees to be "very good." He added optimistically that there appeared to be an "increasing appreciation of the fact that high productive effort is imperative to the payment of high wages."

* * *

In the first six months of 1947, shipments of finished steel totalled 31,172,157 tons, greater than any other peacetime shipments and were almost as large as shipments made during the entire year of 1939, according to the American Iron and Steel Institute. The more than 31 million total included 9,021,292 tons of hot and cold rolled sheet and strip steel, including galvanised, electrical and enamelling sheets, a record tonnage. This type of steel is formed into automobile bodies, baths, refrigerators and other products, and activity in these fields is still not great enough to meet all post-war needs. If production is permitted to continue uninterrupted for the remainder of the year, at the same rate as in the first half, the Institute predicts that the total output of sheet and strip steel should be at least 18 million tons, compared with 15,744,000 tons in the peak year 1941.

* * *

The Manufacturing Chemists' Association has issued Chemical Safety Data Sheet SD-14 on Trichlorethylene, the fourteenth in the series of chemical product safety manuals. The latest chemical safety manual may be obtained at a cost of 20 cents from the Association's offices at 608 Woodward Building, Washington 5, D.C.

* * *

One reaction to the recent banning of loading or unloading of ammonium nitrate at heavily populated ports in the United States is the strong possibility that the Puerto Rican Government may ask the United States Coastguard to reconsider its recently announced restrictions. Puerto Rico uses more han 80,000 ons of ammonium nitrate every year for the mixing of sugar cane fertiliser. Since the chemical is imported from the United States, the Coastguard will have either to revoke or modify its order (effective on August 9) otherwise the local sugar industry may be seriously affected.

* * *

Commenting on the recently announced ban on the acceptance of ammonium nitrate cargoes in the Port of New York, Fire Commissioner Frank J. Quayle states that the ban would be enforced "no matter what its mode of transportation—ship, rail, truck, plane or otherwise." It would apply to all quantities of the material, small or large. At Providence, Rhode Island, Mayor Dennis J. Roberts, acting in accordance with a request made by the United States Coastguard at Boston, has issued an order to his city's port and police officials banning vessels from loading, unloading or having aboard ammonium nitrate while in Providence Harbour. Taking the matter a step further, the Third Coastguard District, responsible to the federal government, and charged with the enforcement of safety regulations in the Port of New York and other ports from New Haven, Connecticut, to Edgemoor, Delaware, has issued an order classifying all nitrate-bearing ships to the status of explosive carriers. A ship's captain or line representative will be required to obtain a permit for the loading or unloading of ammonium nitrate in United States ports if the cargo exceeds 500 lb. Cargoes in excess of 500 lb. will have to be handled at remote points where the possibility of fire or explosion damage will be minimised. As a result, it would seem that the only likely points in the New York area suitable for the handling of ammonium nitrate cargoes are an anchorage in Gravesend Bay, about two miles off Coney Island, and the two-mile-long pier at the Earle Naval Ammunition Depot at Leonardo, New Jersey, which served as an ammunition depot during the war. Mr. Billings Wilson, director of operations for the Port of New York, has said that a safe distance from shore for the handling of ammonium nitrate cargoes ranging from 2000 to 3000 tons would be two to two-and-one-half miles. He emphasised, however, that if "no smoking" rules are enforced and precautions for handling the cargo are taken, ammonium nitrate is "no more dangerous than sugar."

A new glycol, 2-methyl-1,3, pentanediol, a dihydric alcohol, is being made available to industry in experimental quantities for evaluation by the Celanese Chemical Corporation. Possessing an unusual structure, the new glycol is expected ultimately to find wide use in soaps, detergents, softeners, and penetrants, in oils, hydraulic fluids, greases and lubricating oils, and as a plasticiser and coupling agent for resin solutions and printing inks. Containing one primary and one secondary hydroxy group, celanese methyl-pentanediol has been found to have unusual solubility for a wide variety of resins and is miscible with most common organic solvents. Its high boiling point, 215°C., plus limited solubility in water (10 parts glycol in 100 parts water) is said to give it a combination of properties not found in any other glycol now used in the above applications. In addition, the chemical reactivity of the hydroxy groups makes possible the synthesis of various derivatives useful as plasticisers and also suggests the use of methyl-pentanediol as a modifying agent in the alkyd resin field.

* * *

The Third Naval District headquarters in New York has lately announced that the War Department is planning shipments of ammonium nitrate fertiliser to occupied areas of Japan and Germany from isolated naval bases. Loading of some shipments will be undertaken at the U.S. Navy magazine at Theodore, Alabama, and at the Earle Naval Ammunition Depot, under Navy supervision. Presidents of Leonardo, N.J., and the Leonardo Citizens' Association drew up petitions to prevent the landing of ships carrying nitrate at the naval pier. Captain Andrew G. Shepard, commanding officer at the Earle Naval Ammunition Depot, said that any loadings of ammonium nitrate would probably take place a mile or more from shore. One outcome of the present furore over ammonium nitrate was the announcement by a spokesman for the Cosmopolitan Shipping Company, operator of the *S.S. Molda* which was ordered out of New York harbour recently, that in future the company would probably refuse to accept ammonium nitrate cargoes. In official government circles in Washington it was feared that the labeling of ammonium nitrate as dangerous and explosive would endanger the Government's chances of disposing of its ordnance plants to private industry. This assumes that the cost of ammonium nitrate will be increased through higher insurance rates which are expected to come as a matter of course, as well as increased rates for freight, storage, and labour. It is almost certain that longshoremen will in future refuse to handle cargoes of the chemical for anything less than the $3.30 an hour, the rate usually paid for loading ammunition.

The high production levels maintained in the field of inorganic chemicals during May did not carry over into June, while the output of industrial chemicals in this field in June dropped slightly from the previous month, according to the Bureau of the Census of the U.S. Department of Commerce. A survey of 35 major inorganic chemicals disclosed that 24 were produced in lesser volume in June than in May. However, only seven were produced at a lower rate this June than during the same month a year ago.

Production of hydrochloric, nitric and sulphuric acids dropped to the lowest daily figure this year, although it was considerably greater than a year ago.

The output of phosphoric acid and the phosphatic compounds, with the exception of dibasic sodium phosphate, did not follow the downward trend of other groups of chemicals, being in fact the highest for any month on record. Dibasic sodium phosphate production declined slightly from the high May level but more than doubled the output for June, 1946. Only monobasic calcium phosphate was produced at a lower rate this June than last. Production of lead arsenate was the lowest for any June in recent years but a relatively high output of calcium arsenate was achieved. Carbon dioxide (dry ice) production rose to a record figure of 73,713,000 lb. in June, 1947, as compared with 73,574,000 lb. in May and 61,771,000 lb. in June, 1946.

The Department of Commerce has announced that the June production of normal superphosphate fertiliser fell off by 10 per cent from that of June of last year. The Bureau of Mines reports that aluminium output in May (51,116 short tons) was about 1 per cent above the average of the preceding five months and represented capacity operation of production plants for which power was available. The Bureau also reported that domestic production of bauxite established a post-war record in the first quarter of 1947, imports being almost double those of the preceding quarter. Imports, for which Surinam is the chief source, totalled 432,848 long tons, a gain of 83 per cent over the preceding quarter.

Polish Chemical Developments.—It is reported that the rebuilding of the superphosphate plant at Szczecin, Poland, is progressing. The sulphuric acid plant, forming part of the same works and now being rebuilt, is hoped to resume operations next Spring. An oxygen plant also being reconstructed in the same town is intended to go into production before the end of the year.

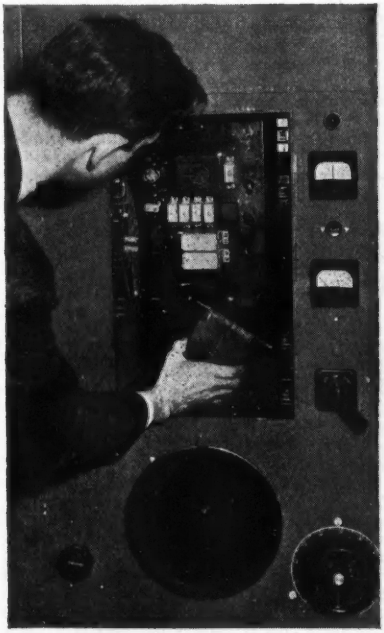
Chemical Comparisons by X-Ray Photometer

THE chemist's job of making chemical comparisons has been made easier, more economical and more rapid by the development of a new industrial instrument known as the X-ray photometer by means of which it is possible satisfactorily to determine such variables as the tetraethyl lead content of petrol, the concentration of an acid in water, the percentage of chlorination in a plastic, or the percentage of ash in coal. These determinations are reached by measuring and comparing the X-ray absorption of a sample and a reference, and although the utilisation of X-ray absorption for this purpose has long been known, the particular method employed in the X-ray photometer is an outcome of wartime experience.

When the United States Army Ordnance Department sought a rapid and reliable method of checking the explosive charge in hand grenade fuses to prevent premature detonation, engineers of the U.S. General Electric Company, asked to attack the problem, devised a method of X-ray testing which made it possible to check fuses at the rate of 4000 per hour. Working with this fuse-testing apparatus was only the beginning and further experiments followed. The company's General Engineering and Consulting Laboratory developed the X-ray photometer which consists of a source of X-rays, a fluorescent screen, multiplier phototube, an amplifier and an indicating instrument. The X-ray beam is interrupted by a synchronous motor-driven "chopper" in such a way that half of the beam passes alternately through each of two analyser cells, one containing the reference and the other the sample. In the half of the beam passing through the reference is placed an aluminium attenuator disc, the angular position of which corresponds with a particular thickness of metal.

Alternate Screen Reception

The X-rays from the two halves of the beam are received alternately on the fluorescent screen, from which the fluorescence is transmitted to the multiplier phototube. The output of this tube passes through an amplifier to a peak comparator where it registers on a microammeter as a d-c signal indicative of the difference in intensities of the two halves of the beam. If the sample and the reference are identical the intensities of the two halves of the beam as received on the fluorescent screen are equal and the ammeter reading is zero without the use of the attenuator. If the sample and the reference are different it becomes necessary to introduce aluminium by means of the attenuator until the two halves of the beam become of equal intensity and the reading returns to zero. From the thickness of aluminium introduced into the reference half of the beam it is possible to determine empirically the proportion of certain elements in the sample as compared with the reference. In general, the method is most applicable where there is a considerable difference in the atomic numbers of the main substance and the particular ingredient to be measured.



X-ray photometer for speedy chemical comparison. An operator is shown placing samples in position preparatory to conducting a test

In actual operation the X-ray photometer has been found to work satisfactorily up to a speed of six samples per hour. Under most circumstances the limiting factor has been found to be the time required for the preparation of the sample. Liquids, which must be measured as they are put into the analyser cell, require more time than solids when the latter are specimens of uniform thickness. Powdered solids such as coal, which must be weighed into the analyser cell, require more time than liquids. Preparation of the samples, however, can be arranged independently.

(*Continued on page* 301)

ISOTOPE DETECTION BY TRACER MICROGRAPHY

A NEW method for the more effective tracing of radioactive isotopes in materials in which they have been intentionally introduced has been developed by L. Marton, of the United States National Bureau of Standards, with the co-operation of P. H. Abelson, of the Department of Terrestrial Magnetism, Carnegie Institution of Washington. In this procedure, by means of a magnetic focusing arrangement,

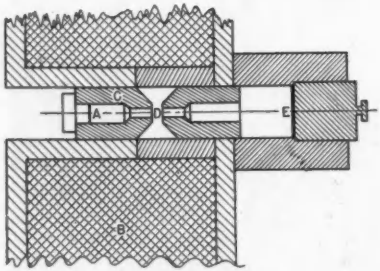


Fig. 1. Schematic diagram of the apparatus used for the location of radioactive tracer elements within a sample material by the new method of "tracer micrography." The surface of the disc at A is covered with a substance containing radioactive isotopes. The magnetic coil B causes the soft iron pole pieces C to produce an intense magnetic field at D. Electrons emitted in nuclear disintegrations of radio-isotopes within the sample are brought to a focus by this magnetic lens upon a photographic film at E

the radiation given off by a radio-isotope within a sample material is made to form an image of the emitting surface upon a photographic plate. The image may then be used in studying the distribution and concentration of the radioactive element present in the sample.

In many chemical, biological, biochemical, and other fields of research, there is growing application of the method of tracers, in which the isotope of a given element is used as an indicator to tag or label certain groups of atoms so that they may be distinguished from other atoms of the same kind. Identification of tracer elements is at present greatly facilitated through the use of radioactive isotopes, which, because of recent developments in atomic energy, are now available in large quantities and are relatively easy to detect through their radiations.

In order to improve the resolution of former tracer methods, it was decided to use electron optical image formation for determination of the distribution of a radioactive element within a given sample. This process, called "tracer micrography," is based on the emission of high speed electrons (beta rays) by many tracer elements and the use of magnetic lens elements for forming an image on a suitable recording surface.

In the absence of any means for correction of the chromatic aberration of electron optical lenses, the first micrographs were limited to those elements that emit electrons of uniform speed. After some attempts with columbium 93, yttrium 87, strontium 85, strontium 87, protactinium 233, and gallium 67, the last was selected for the initial tests. Gallium chloride prepared by chemical separation from zinc, was bombarded by heavy hydrogen nuclei in the cyclotron at the Carnegie Institution, and the solution was evaporated drop after drop on a ¼ in. tantalum disc. Radiation emitted from the surface of the disc, upon passing through a magnetic lens consisting of a small iron-clad coil with Armco iron pole pieces, was brought to a focus on a photographic film at a distance of about 3½ in. An image of the tantalum disc was

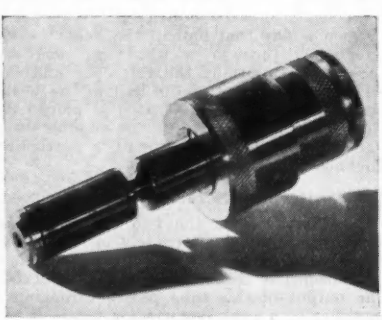


Fig. 2. Pole pieces of the magnetic lens A tantalum disc with a radioactive sample on its surface has been inserted at left. The larger-diameter portion at right is a simple film holder. When a strong magnetic coil is placed around the pole pieces, a magnetic field is produced, which focuses electrons emitted by radio-isotopes upon a photographic film. An image of the sample is thus obtained showing radioactive areas

thus obtained showing radioactive areas. The conditions were selected so that a linear magnification of 2 was produced.

For calibration of the instrument, the photographic film was replaced by a Geiger counter, and the lens current necessary to produce a maximum number of counts in unit time was determined for radiations of varying velocities. This established the focusing currents for a given type of radiation.

In preliminary experiments with samples of different concentration and thickness of the radioactive layer, exposure times ranged from two to twelve hours according to the age and concentration of the sample and the numerical aperture of the lens. It was found that micrographs with good definition were obtained consistently when the layer was sufficiently thin to avoid considerable self absorption. The best resolving power attained so far has been about 30 microns.

The simplicity of this method, both in apparatus and technique, is one of its more important features. Vacuum requirements are very moderate, since the mean free path of the electrons is large in comparison with the apparatus dimensions, even at forepump pressure.

Scientists at the (U.S.) National Bureau of Standards expect to obtain further improvements in tracer micrography through after-acceleration of the beta particles by means of a homogeneous electrostatic field. Such after-acceleration may well result in reduced exposure time and in better resolution due to a reduction in spherical aberration. A further reason for after-acceleration is that chromatic aberration which is always present, even in sources emitting particles of uniform speed, can be markedly decreased if the accelerating potential is at least comparable in magnitude with the energy of the primary emission.

Fig. 3. Tracer micrographs showing the distribution of radioactive isotopes within a thin layer of sample material on the surface of a tantalum disc. These micrographs were obtained at the National Bureau of Standards by the electron optical method, in which a magnetic lens is used to focus electrons emitted by the radio-isotopes upon a photographic film. The resulting patterns are thus images of the surface of the disc showing radioactive areas. Improved resolution can be obtained by reduction in the size of aperture

INDIA'S CHEMICAL PLANS

INDIA can become self-sufficient with regard to fine chemicals, drugs and pharmaceuticals within a period of 15 years, according to the report submitted by the panel on the industry set up by the Government of India under the chairmanship of Col. R. N. Chopra. The panel feels that the proper development of the industry would depend very much on working out a well-balanced and integrated plan for the production of heavy chemicals, coal distillation products and organic solvents. Further, as the production of these materials is also necessary for the production of dyestuffs, artificial fibre, plastics, and synthetic rubber, a workable programme can be drawn up only by integrating the reports of the panels on these different industries.

Among the heavy chemicals, the manufacture of three items, *i.e.*, chloro-sulphonic acid, sodium and chloride of phosphorous, is very important and may be taken up without delay, while the production of intermediates from coal distillation products, such as aniline, acetanilide, chloro-benzene, phenoldiethyl aniline, para-anisidine, para-nitrotoluene, phthalic acid and anhydride, etc., deserves prompt attention.

Solvents

With regard to solvents, India produces ethyl alcohol in large quantities at competitive prices. Acetone, too, is being produced at one of the ordnance factories. Immediate arrangements should meanwhile be made for the manufacture of acetic acid, butyl and amyl alcohols and ethylene oxide. The manufacture of lactose for penicillin and thourea and guanidine nitrate for sulpha drugs is also recommended.

The most practical way to establish the fine chemicals and drugs industry in India, asserts the report, is to decide first upon the minimum number of drugs and fine chemicals essential for home consumption. Moreover, instead of the manufacture of essential drugs waiting for the production of basic chemicals, an early start should be made without them, utilising the raw materials already available in India until national resources are developed.

Shark Oil Industry

Pointing out the scope which exists for the expansion of the shark liver oil industry, the report recommends that a Central Board, representing the relevant departments of the Government of India, the Departments of Fisheries of the different maritime provinces and non-official experts, with a whole-time executive, should be formed to work out the necessary steps to put the shark liver oil industry on a firm and permanent basis.

U.S. POTASH INDUSTRY IN 1946

MORE new records were made in 1946 in the U.S. potash industry, both sales and production of marketable potassium salts reaching new high levels, reports the U.S. Bureau of Mines. Production in 1946 was 1,687,735 short tons of potassium salts containing 931,812 tons of equivalent potash (K_2O). This was an increase of 99,430 (57,569 tons of K_2O) tons of potassium salts over 1945. The production of marketable potassium salts in the United States has increased each year since 1934. Sales (1,673,249 tons) were 76,089 tons greater in 1946 than in 1945, and contained 928,374 tons K_2O. The value of the sales in 1946 was over 32 million dollars. The average value per ton of the potassium salts sold in 1946 was $19.23, slightly higher than that of 1945. Stocks of potassium salts in producers' hands at the end of 1946 were larger than in 1945. Exports of fertiliser potash materials continued to decline, whereas those for chemical uses were considerably larger. Imports of potash materials for fertiliser purposes increased in 1946, while those of chemical materials decreased. According to the American Potash Institute, domestic consumption of potash again made a new high record—actual sales for consumption reaching 862,532 tons.

Production of both grades of muriate of potash and of sulphate of potash and sulphate of potash-magnesia were larger in 1946 than in 1945. Production of manure salts (98,333 tons), however, even with the inclusion of spillage of higher grade salts, continued in 1946 the decline which began in 1944, and is now much less than half of the 1943 production of 242,189 short tons.

The dominant factor in the domestic potash industry is still the production from the Western States. California, New Mexico, and Utah furnished virtually all the 1946 output, the larger part coming from the deeply buried Permian saline sedimentary deposits of sylvite and langbeinite of the Carlsbad region of south-eastern New Mexico. The Eastern States supplied only a small quantity—from well brines in Michigan and as a by-product of cement operations.

Industrial Diamond Bulletin

The Industrial Diamond Information Bureau, Industrial Distributors (1946), Ltd., St. Andrew's House, 32-34 Holborn Viaduct, London, E.C1, publishes monthly a bulletin containing abstracts of articles dealing with properties and industrial applications of diamonds, together with notices of patents and patent applications in many States. A copy of this bulletin may be obtained, free of charge, on application to the above address.

ENTERPRISE SCOTLAND EXHIBITION

ALTHOUGH the Enterprise Scotland 1947 Exhibition is a tacit admission of the importance of the chemical industries—as nearly every product relies at some stage on a chemical process or constituent—the industry, as such, has no separate section and only a limited representation. Designed essentially to show design in action and to feature merchandise of excellent design, the exhibition has concentrated rather on finished products than on Scottish industry as such.

One section of vital interest to chemical men is the Scientific Instrument Section. Here, from Kelvin, Bottomley & Baird, Ltd., are deadweight thickness testers, a galvanic sizing tester, a beating and freeness tester, a Sharman tubal insufflation apparatus, and an electrical barograph, among other items. Mu-Tron, of Edinburgh, a newly registered company, has a Universal analyser on show. W. B. Nicholson (Scientific Instruments), Ltd., of Glasgow, show a lever balance designed for rapid weighing, while Peter Stevenson, Ltd., of Edinburgh, well known as manufacturers of chemical registration equipment, show gluemeters, wall thermometers, hydrometers, battery testers, saccharometers, hygrometers, angle thermometers, salinometers, specific gravity beads, scientific glassware of many types.

Apart from these displays, the exhibition as a whole stresses the debt of manufacturers to the industrial chemist, a point admitted by the designers at the outset. Entering the exhibition, the visitor faces a 10 ft. high, four-section glass panel screen, sand blasted, stone etched and acid finished to show figures 8 ft. high of James Watt, Henry Bell, Lord Kelvin, J. B. Neilson (technician in the blast furnace industry) and Robert Foulis, five Scots whose work in their respective spheres gave Scottish industry the impetus necessary in the past century. No better acknowledgment of the present debt of commerce to the technician and the chemist is necessary than the goods which are displayed in this show.

Cellulose Acetate Demands

Addressing the 10th ordinary meeting of Dufay-Chromex, Ltd., last week, Sir Herbert E. Morgan, presiding, said that cellulose acetate sheeting products are in great demand and preparations are in course which, subject to availability of raw materials and fuel, should allow them to double the output capacity as from December next. The company is making preparations to manufacture cellulose acetate containers by a new process.

SPANISH PAINT INDUSTRY

Manufacturers to Present Strong Case for Tariff Revision

PURSUING the policy of opening its columns to discussion of special problems affecting particular industries in the chemical field, the Spanish journal, *Revista Española de Quimica Aplicada* (ION) devotes several pages of its April-May issue to the troubles of the paint, varnish and allied industries. These will, no doubt, be further ventilated at the forthcoming third annual congress of the paint and allied industries, in Madrid in October next, at which will be announced results of a prize competition for the best essays on both the technical and economic aspects of those industries, including two firsts of 5000 pesetas each.

In the published discussion, leading manufacturers and others connected with the industry took part, among them: Señores Fernando Boronat (Director of the National Economic Section of the Vertical Syndicate of Chemical Industry), Rafael M. Badia, J. Echevarria (Machimbarrena y Moyua, S.A.), Fernanado Ruiz (Cia. Peninsular de Industrias, S.A.), A. O. Raurich (president of the forthcoming congress), S. Medina-Castellanos (Barnices Claessens y Romero Giron, S.A.E.), and Julio G. Mata (Graficolor Hartmann Hermanos, S.A.).

The chief subject of complaint among the manufacturers is the apparently anomalous and unfair incidence of import tariffs imposed to protect certain home industries, such as those supplying some of the essential raw materials needed in the paint and varnish trades, linseed oil, rosin (colophony) and turpentine, mineral pigments (chromes and zinc oxide), and fish oils.

Home Production Handicapped

Although import duties are also levied on manufactured paints, varnishes and printing inks, these can still be sold in the home market at lower prices than those of the Spanish manufacturers, owing to the high cost to the latter of raw materials. Thus, printing inks containing 50 per cent aniline dye pay 0.40 gold pesetas per kilo, while the same ink of home manufacture pays, on the basis of 50 per cent dye content, 3 gold pesetas per kilo. A similar case is that of nitrocellulose paint.

The adverse effects of this tariff policy are particularly marked in respect of linseed oil. Import is practically prohibited, and native seed supplies are strictly rationed at about 6 pes. per kilo, which is more than double the cost in the world markets. Yet Argentine linseed may be freely imported and costs only 1.80 pes./kilo delivered, as compared with 6-8 pes. for Spanish linseed, and 25-30 pes./kilo for the oil.

Boronat says that the native product satisfies only about half the demand and, since foreign seed can be freely imported at a relatively low cost, it would seem that the other half of the demand should be met at a similarly low cost, if the Spanish oil-mills are fairly efficient and free to sell to the paint manufacturers. The native oil is of poor quality owing to the fact that the flax is grown chiefly for its fibre.

U.K. Supplies Needed

The position in regard to naval stores (turpentine and rosin) is not much better, although Spain is the third largest world producer of these products. White spirit, often used as a cheap substitute, is controlled in Spain by the Campsa and its price much higher than in the world markets. Much the same applies to other raw materials such as chromates and oxides and other pigment materials. The price of methylated spirit is very much above the average international level. Now that German supplies of dyes and pigments are no longer to be had, it is thought in some quarters that the English chemical industry could wholly or partly fill the gap.

Reference is also made to aluminium hydrate, glycerine, olein, and synthetic resins. Manufacture of the last has made some progress in Spain in recent years, but prices are still high: Albertol 16-30 pes./kilo; Novolac 40-50 pes./kilo; and Alkidal 60-70 pes./kilo. It is emphasised that these prices are much above those for English or Dutch products.

Apart from raw materials, other difficulties arise in obtaining much needed new and up-to-date plant—special reference being made to the improved and efficient type used in England—and in securing the requisite sheet metal for containers at a reasonable cost.

It is intended to press for revision of the duties still more insistently—earlier representations having produced no results—at the Congress in October, and meanwhile the Chemical Industry Syndicate, under Boronat, has prepared a strong case. The latter again urges that the two principal protective measures required are (1) to maintain present restrictions on imports of paints, etc., import licences being granted only in exceptional cases; and (2) to reduce duties on essential raw materials not produced or likely to be produced in Spain, while at the same time raising the tariff on certain other materials, intermediates, or finished products. The whole tariff policy should be governed by a fair and balanced view of Spanish chemical industry as a whole.

Scientists and Technicians from Germany

Modification of Scheme

AS is well known, it was decided in December, 1945, as part of the general policy of securing industrial intelligence from Germany, to bring to the United Kingdom a limited number of scientists and technicians drawn from those fields in which German science and technique was most advanced. All proposals for the employment of Germans under this scheme had to be sponsored by a Government department and approved by an interdepartmental panel set up under the chairmanship of Sir Charles Darwin.

Hitherto, the scope of this scheme has been restricted to Germans who can make a scientfiic or technical contribution to industry which cannot be made by a British subject, and the knowledge gained from their work has been made freely available to industry as a whole.

Within these strict limits a considerable amount of valuable knowledge has been secured and some progress has been made towards incorporating it in our industrial technique. Experience has, however, shown that if the exploitation of German scientific and technical knowledge is to be carried out to the fullest possible extent, some provision must be made to enable those Germans whose exceptional ability and usefulness have been proved to be retained on a more permanent basis by firms willing and able to translate German ideas into production. Authority should also be given for the entry into the U.K. of production engineers and technicians having the specialised knowledge and experience required for the rapid development of the underlying idea. Further, as the capacity of research associations to take Germans and provide specialised equipment has already been largely satisfied, and as in some fields no research association exists, it is necessary to rely increasingly on private firms to obtain the maximum benefit from German ideas and knowledge.

Accordingly, the scope of the Darwin scheme has now been modified. As previously, only Germans who have a significant technical contribution to make to British industry and who are required to fill positions for which no British subjects are available will be admitted. They will all be volunteers and brought over initially under Government contracts, and arrangements will be made wherever possible to give all potentially interested firms access to them. Subsequently, if the Darwin panel considers it desirable for the German to be retained after the initial period of six months and employed by a particular private firm, the German will be permitted to enter into a contract with the firm like any other alien entering the United Kingdom under a Ministry of Labour permit.

If the services of the best German scientists and technicians are to be obtained for this country it is important that applications for their services should be submitted *as soon as possible* to the production department concerned. In the majority of cases this will be the Raw Materials Department of the Board of Trade.

Other nations are anxious to obtain the services of these men and delay in approaching them may mean they will not be available for British interests.

International Plastics Training Agreement

AN agreement has been reached between the British Institute of Plastics Technology, London, the Synthetic Materials Institute (Kunststoffeninstituut) T.N.O. of Delft, Holland, and the Technological Institute V.I.V. of Antwerp, Belgium, regarding the procurement of information and education on plastics. The British Institute is to arrange regular written courses for adult pupils in Dutch language and possibly also in French for Walloons. The instruction will be supported by lectures, exhibitions and films. The aim is to supply uniform information services and to foster investigation to the common advantage. The conflict on patent matters between Dutch plastic producers and Imperial Chemical Industries, Ltd., will not be allowed to interfere with these new arrangements.

As reparations from Germany, Holland has been awarded the Paraxol Works of Lippoldsberg for the manufacture of pentaeritrite. The equipment of this factory is reported to be of recent date, so that the Dutch capacity for making plastics will be tightened.

Output of mineral salt in Holland has now risen to much more than the pre-war level. The industrial activity of this branch, as well as the notable expansion of salt-derived chemistry, is now being concentrated at Hengelo. The former installations of Boekelo, which had suffered from Allied bombing during the war, are to be abandoned. The annual salt output runs to about 200,000 tons.

Chemicals in South Africa

From our Cape Town Correspondent

ACCORDING to figures released recently in South Africa, the Union imported chemicals, drugs, dyes and colours worth £607,400 from Britain during the first quarter of 1947, as compared with only £441,200 in the corresponding period of 1938.

* * *

No move can be made to establish the first undertaking in South Africa's new £20,000,000 industry to produce oil and petrol from coal until the Minister of Economic Development returns from Europe, when appointments will be made to the Liquid Fuel and Oil Advisory Board. This board, for which provision is made in the Liquid Fuel and Oil Act, and to which the Governer-General gave his assent on June 4, will be the body to report on and recommend any applications for licences. The first application to be considered is one from the Anglo-Transvaal group, which has been investigating overseas processes and which has been planning to set up the industry for more than ten years. The Government is also investigating latest processes. The acting director of the Fuel Research Institute and the assistant industrial adviser to the Department of Commerce and Industries are examining plants in Britain and America and gathering information. Although no estimate of a total output can be made at present—the Liquid Fuel Board will lay down the scale on which operations will start—it will be greatly in excess of 10 million gallons a year. South Africa claims to have one of the richest coal deposits in the world and there is adequate cheap power available.

* * *

Although DDT has apparently proved effective in killing off the tsetse flies in large areas of Zululand, it has not destroyed the entire insect life of that region. Following a recent test (nine dustings from the air with DDT smoke), a " light trap " was put out at night, and next morning it was found to contain more than 6000 insects of many kinds, thus allaying fears that spraying would disturb the balance of Nature.

* * *

A £1,000,000 company, the African-Italian Financial and Industrial Corporation, Ltd., has been formed to finance and undertake the transfer of a number of Italian concerns to South Africa. Among the factories is a £5,000,000 alcohol plant, which will be established in Natal and will, it is stated, have some connection with the Union Government's plans to manufacture oil and petrol from coal.

General Chemical Corporation, Ltd., is to erect a new factory on a 40-acre site in Johannesburg for the manufacture of a new range of products for the tanning and other industries. The firm's existing factories in Johannesburg and Durban make tanning oils, fat, liquors, pit disinfectants and anti-mould compounds. Developments overseas are being investigated and arrangements with British and American concerns are likely.

* * *

The decision of a large Dutch concern, the United Leather Paint Factories of Holland, to buy a ten-acre site at Springs is a further indication of the growing popularity of the Reef in the eyes of industrialists. The firm is to build a factory and storage sheds, and a section of the plant is expected to be ready for operation by the end of the year. It is understood that production will at first be confined to the furniture lacquers. A large proportion of the necessary raw materials is available locally.

* * *

The Consolidated Portland Cement Company is to establish a £1,000,000 industry near Port Shepstone, Natal, most of the capital having been raised in the Union. Some machinery has already arrived from Britain, and when operations start in about a year's time, production is expected to be geared to an output of 200,000 tons a year. Work on the 500-acre site has been started by the London engineering firm of Henry Pooley, Ltd., which has set up a branch in South Africa to undertake such contracts.

Another development in the cement industry comes from White's South African Portland Cement Co., Ltd., which is now building a new factory at Lichtenburg at a cost of £2,000,000. The firm's 34-year-old factory at White's, Orange Free State, together with the new one, will give a combined output of 10 million sacks of cement a year. It is also planned to expand the production of the company's special manufactures at Industria, Johannesburg.

Easier U.S. Alkali Position Foreseen.—According to the president of the Pennsylvania Salt Manufacturing Co.—one of the U.S. major alkali producers—the alkali position is becoming easier and production next year should suffice to meet all needs. Repairs and replacements at present being executed should increase the current output by about 10 per cent, while new plant construction should lead to a further 10 per cent increase.

Glass in the Laboratory—V

Cutting Glass Tubing

By I. C. P. SMITH, B.Sc., F.R.I.C.

THE study of the various methods of cutting glass tubing is essential to those taking up glass blowing, but it is almost equally valuable in the laboratory, and the cutting of a glass tube, bottle, or beaker need not be the hazardous undertaking which it frequently becomes. It is proposed therefore to review familiar and unfamiliar methods for both hand and machine operation, so that a choice may be made according to the circumstances. To the best of the writer's knowledge the method included under "Cutting Glass with a Hack-Saw" is described for the first time.

Glass Knives

The most familiar way of cutting glass tubing is first to produce a scratch or cut round the tubing, and then apply further means of converting this cut into a crack.

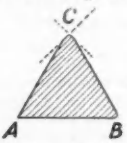


Fig. 1.

The usual glass knife, which is supplied with or without a handle, is made from carbon steel, hardened glass-hard by heating to bright redness and quenching in water. (Mercury is also advocated, if it is available.) A piece of hack-saw blade may be employed, but it should be heat-treated as indicated. The edge of the knife should be ground at an inclusive angle of 45°, preferably before hardening, and sharpened up if necessary afterwards. For sharpening during use a coarse-grain, hard-bonded carborundum stone is best, such as a scythe stone obtainable at most ironmongers. If an engineer's grinding wheel is employed, the knife should be given rapid strokes right along the blade to avoid overheating. A wetted wheel may be employed for this reason to advantage, but not one of the glass grinding wheels, as the owner of this wheel may object. The small "ampoule-knives" sometimes supplied with boxes of ampoules and manufactured by a stamping out process are frequently very good and the one that breaks easily is usually the best.

There are on the market glass knives made from non-ferrous tool-tip alloys and from tungsten carbide. Of these, the former are very good and particularly useful for cutting the hard glasses for which they should be reserved. They may be sharpened on a fine carborundum stone, preferably with the movement employed in sharpening a wood-working tool, in order to produce a fine straight edge. Knives made from tungsten carbide are a little too brittle and for this reason are inclined to lose their edge rapidly. Moreover, they require a diamond-embedded lapping wheel for re-sharpening.

Triangular files are cheap and readily available and form an excellent substitute for the glass knife if properly handled. The best form is a fine-cut file 4 in. or 5 in. long. Swiss jewellers' files are probably the best. When a file has lost its edge through use, it should not be discarded but should be re-sharpened by long strokes on the grinding wheel, giving the edge a blunter angle than the original 60°. In Fig. 1, A is an original angle, B as bluntened and C re-sharpened. It will usually be found to cut better than before.

The proper action of the knife in making a cut is a clean firm movement round the glass, not a sawing action in one place, and not a backwards and forwards movement about the section of a circle. The cut should be as truly as possible in a plane perpendicular to the axis of the tube. There are two techniques in holding the glass-knife: the one and possibly the simpler is to rest the glass on the edge of the bench and cut round the top as shown in Fig. 2; the other, to hold the knife under the glass with the glass held in the crook of the thumb, as shown in Fig. 3.

The single clean cut is important for two reasons, the one to obtain an incipient crack which is not a confused mass of little cracks, and the other to preserve the cutting edge of the knife. A second stroke with the knife in an already made cut has a bad wearing effect on its edge.

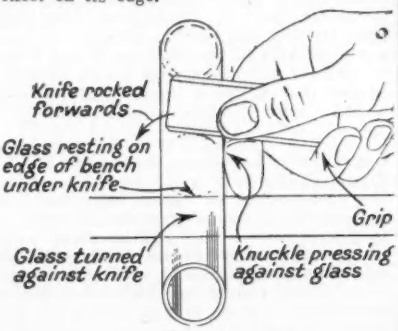


Fig. 2.

The next thing is the action of breaking the glass. On small diameters, the thumbs are placed together opposite the cut and a simple breaking action applied. On larger diameters, up to, say, ¾ in., the action is one of pulling with a slight bending action, the cut being, of course, on the outside of the bend. When one end is short it should be held in a duster. Some glass-blowers always wet a cut before breaking; some wet the glass-knife first, and some do not believe either helps, and work dry. The writer is convinced that wetting the cut does definitely make the glass easier to break; the action may be due to the capillary force of the moisture in the microfractures of the cut.

When the cut is too near the end of the tube, or, for instance, on larger sizes when a breaking action is considered too risky, the little hot spot of glass is very useful. First a rod of glass 2 or 3 mm. dia. is prepared and the end is heated to form a molten knob about 3 or 4 mm. dia.; this is placed on the cut with a slight initial stroking action in the line of the cut. A crack usually starts immediately and is led round by movement of the hot knob in advance of the crack, the knob being reheated if necessary.

A more useful adjunct to the glass-knife than the hot spot for cutting any size of tubing is the cutting jet. It consists of a small gas jet giving a flame about ⅜ in. to ½ in. long, and it is important that this should be controlled by the smallness of the aperture of the jet and not by constricting the gas flow before the jet. The difference is that the former makes a flame that is hot and firm, while the latter causes a softer flame and one liable to bending in draughts of air. A suitable jet is an Amal No. 5 or a Bray type 441, No. 0, in a metal tube holder, or it may be made from glass tubing, preferably resistance tubing, by taking a piece of 8 or 9 mm. tubing with about 1 mm. wall and constricting it in the middle, maintaining a fairly uniform wall, until the bore is about ¼ to ½ mm. It is then cut in the middle and the jet tried for size. If it is too small, cut some off the end of the glass. If it is too large, heat the tip on the blow-pipe flame carefully, watching the flame decrease. The jet is attached to a length of light rubber tubing and used like a pencil.

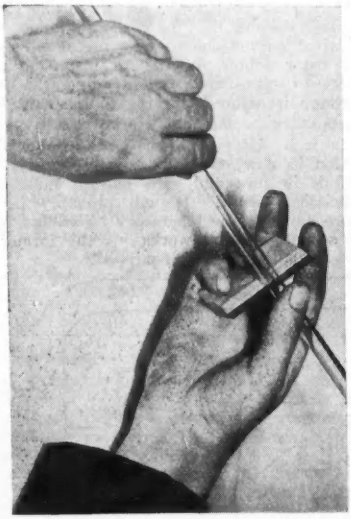


Fig. 3.

Soda Glass

Having obtained a good jet, it is trained tangentially on the surface of the tube along the knife-cut, turning the tube back and forth so that the flame more than covers the knife-cut. On soda glass a crack usually starts quite quickly and easily. On resistance glass it may be necessary to stroke the heated glass with a wetted finger along the line of the cut. When the crack has started, it is followed round with the cutting-jet.

This technique may be employed on any size or thickness of tubing or bottles, beakers, etc. Bottles may need handling with some care, but those should be selected which look good, of even wall-thickness, and free from bubbles, dirt, etc., as they are most likely to be free from strain and give a good crack. If a strain viewer is available, examine the bottle first with this.

Iron Hooks

These hooks are bent from ⅛ in. to 3/16 in. iron wire in the form of a semi-circle, the remainder of the rod being bent in line with the diameter. For cracking a tube already cut with the knife, a hook is chosen slightly larger in diameter internally than the glass; it is heated to redness and the tube carefully rotated in it in the line of the crack. This usually works well, especially for soda glass in the large sizes. It does not suit the resistance glasses. Some workers prefer to run the knife-cut right round the tube.

In cases when a maximum surety is required in unskilled hands, with such materials as are available in the laboratory, the use of strips of blotting paper or filter paper wrapped round the glass is advocated. The paper is cut in long strips ½ in. or ⅝ in. wide, wetted and carefully wrapped round the glass, giving about four layers, 1/16 in. either side of the knife-cut, leaving a channel

about ⅛ in. wide about the cut. A small hot blow-pipe flame is then directed round the channel, at an angle to the glass and moving backwards and forwards an inch or two in either direction. On thick-walled tubing or a bottle this usually starts a crack quite neatly and it is then run round by stroking with the flame slightly in advance of the crack.

Stains in Joins

If a glass-knife is employed to cut a piece of tubing before making a join, it should always be remembered that the roughened line of the cut, together possibly with the inclusion of heavy metals from the knife, causes a stain in the join; this stain, apart from the trace of colour from the metals, consists of a mass of tiny air bubbles, trapped in the roughness of the glass and fused in. The more careful the knife-cut the less may this stain become, but it is almost impossible to eliminate it. Apart from the use of the glass-knife, different methods of cutting the glass may give greater or less stain; the diamond is probably the best among non-production methods, and among production methods the cleanest cut is obtained when the tube is rotated against a circle of tiny oxy-gas jets followed by rotating it against a wetted steel or abrasive wheel. It is proposed to describe these and other methods in the next article. For ordinary glass blowing, when a clean join is particularly required, a knife should not be employed, but the glass end should be drawn down, the tip blown out and the end heated and tooled out to the original size; overheating should be avoided as this again is detectible through loss of soda or other volatile constituents from the glass. This, too, will be the subject of a later article.

Cutting with a Hacksaw

The heading is intended to be misleading, and to draw attention to a simple method of cutting and notching glass by any novice in the art and, of course, equally by the expert. It enables a cut to be made slowly but surely in the required direction without risk of a crack running where it is not intended. Actually all that is used is the hacksaw frame with a piece of wire having loops twisted on the end in the place of the blade; a softish wire is best, such as copper, iron or nichrome, the thickness for cutting purposes anything from No. 24 to No. 18 gauge and for notching up to No. 12 gauge. Copper wire is first stretched slightly to harden it. In addition is a small dish containing 180 mesh carborundum powder or other abrasive and water. The grade mentioned is good, but any other grade near this will do, preferably on the fine side.

Hacksaw Operation

Fig. 4 shows the method of operation. The glass article is clamped fairly firmly, preferably in a vice, using corrugated paper for protection. The dish of abrasive is placed on the bench beyond the vice in line with the cut, and a little wet abrasive is picked up in the finger and thumb of the left hand and loosely held about the wire so that the wire may slide through them, maintaining on itself a layer of the abrasive. It is now only necessary to "saw" in the ordinary way, applying only light pressure and picking up a little more abrasive as necessary. Care should be taken not to let the wire jam by allowing the saw to get out of line with the cut, as this may cause a small chip of glass to flake off. Some practice may also be required to maintain a straight cut, but generally it is best to cut vertically downwards, keeping the frame of the saw upright. As a corollary, of course, the cut may be made to follow any required curved course. Furthermore, starting from a hole drilled, for instance, in a sheet of glass and by threading the wire through it before attaching to the saw, any shape may be cut out of the centre.

It must be emphasised that the cutting action is slow, though not unreasonably so, but it is sure and safe and is suited for specialised work. It will probably be of more value to the laboratory technician than in a glass-blowing works, as the former is not usually so well equipped.

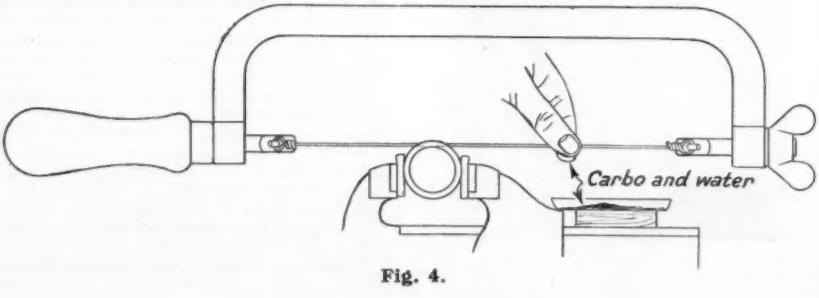


Fig. 4.

PETROLEUM SEARCH IN AUSTRALIA

Shell's Queensland Programme

THE Shell Company of Australia, Ltd., is to renew immediately the search for oil in Australia. A four-year plan has been approved by the Government of Queensland, involving a total expenditure of £1 million by 1951 and envisaging exploration and drilling work over a territory of about 50,000 square miles. The two areas to be investigated have already been fully surveyed. It is hoped that the results of this work will give the lie to those who hold the view that Australia is a barren continent as regards the occurrence of natural oil deposits.

U.K. and U.S. Equipment

Australian materials are to be used as far as possible, but since there is no domestic manufacture of drilling equipment, etc., orders have been placed both in this country and in the United States. It is the company's policy to train Australians in oil drilling, and a number of persons who had been sent to oilfields of the Shell group overseas to be given training in drilling, are already available for work in Queensland.

The search work will be carried out by Shell (Queensland) Development (Pty.), Ltd., a subsidiary of the Shell group. It is not generally known that field investigations were actively carried out in Queensland between 1940 and 1942, by some 50 oil experts, but their activities had to be suspended owing to the war. However, mapping, geo-physical and topographical surveys had been carried out, as well as an aerial survey of the country.

To 10,000 Feet

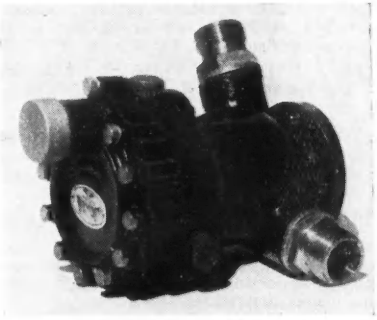
This work has meant a considerable saving of time and has made possible the sub-surface investigation which is now about to begin. It will involve the drilling of some thirty test wells with an aggregate depth of 50,000 ft., to determine the best site for deep drilling. It is expected that a well will be brought down to about 10,000 ft., *i.e.*, the deepest well ever drilled in the Commonwealth, involving an outlay of no less than £600,000.

NEW METERING PUMP

At Olympia Exhibition

NOTABLE among the range of equipment being shown by Bryce Fuel Injection, Ltd., at the Marine and Engineering Exhibition at Olympia this week is an entirely new volumetric metering pump. This is capable of delivering fluid at a constant volume, regardless of viscosity, pressure or suction. A micro-volumetric control of the fluid is provided at all times. The pump is gearless, gives a pulseless flow, is immediately adjustable for setting and has a pumping range up to 50 gal. per hour. It has wide application in many spheres of industry.

A representative selection of Bryce fuel-injection equipment is also shown on this stand, and in addition to the company's range of single-cylinder pumps, injectors and nozzles, of special interest is an all-speed hydraulic governor to govern engines operating over a wide speed range. It secures an immediate response to the controls that is a feature of the petrol engine and has so far been lacking in the control of compression-ignition power units. The working fluid is fuel oil as used in the injection pump.



Volumetric metering pump

(*Continued from page* 291)

If this is done there is no difficulty in maintaining the six per hour rate regardless of the physical form of the material to be tested.

An outstanding advantage of this method of comparison is that it independent of the physical state of the substance being tested, because the amount of X-ray absorption by a given mass of material is always the same, whether the material is hot or cold, gaseous liquid or solid. For example, the absorption per gram is the same in steam, in water and in ice. Similarly, because X-ray absorption is an atomic property, measurements will be identical when an element is alone and when it is in chemical combination. An oxygen atom, for instance, will register the same whether it is an element or in any oxygen compound.

German and Japanese Technical Reports

THE following are among the latest German and Japanese Technical Reports, copies of which are obtainable from H.M. Stationery Office at the prices quoted.

BIOS 78. Some aspects of German powder metallurgy (preliminary assessment) (2s. 6d.).

BIOS 303. Production of luminous compounds at the works of Auer Gesellschaft A.G. (2s.).

BIOS 1046. German carbide and cyanamide industry. Manufacture of calcium cyanamide (2s. 6d.).

BIOS 1148. Anthraquinone. Manufacture by air oxidation of anthracene at I.G. Farbenindustrie, Ludwigshafen (2s.).

BIOS 1149. I.G. Farbenindustrie: The manufacture of certain fast bases and their intermediates and of intermediates for naphthol-as products, etc. (14s.).

BIOS 1152. I.G. Farbenindustrie. The manufacture of miscellaneous naphthalene intermediates (11s. 6d.).

BIOS 1154. Some miscellaneous organic intermediates and products: Manufacture (mainly) by I.G. Farbenindustrie (4s. 6d.).

BIOS 1161. Emulsion polymerisation of vinyl acetate (1s. 6d.).

BIOS 1166. Synthetic rubber. Interrogation of Dr. Bayer and Dr. Roelig of I.G. Farbenindustrie A.G., Leverkusen. (3s. 6d.).

BIOS 1191. Thermo-plastic and thermo-setting resins. Interrogation of Dr. Eisenmann (Dynamit A.G. Troisdorf) (3s.).

BIOS 1291. German acetylene chemical industry. Vinyl acetate monomer (3s. 6d.).

BIOS 1293. German acetylene chemical industry. Monovinyl acetylene. (1s.)

BIOS 1301. The electro-chemical industry. Germany (5s. 6d.).

BIOS 1366. The production in Germany of extrude sections and tubes in aluminium and magnesium alloys (12s.).

BIOS 1381. Hydrogen peroxide plant at Bad Lauterberg. Interrogation of Dr. W. Piening (1s. 6d.).

BIOS 1399. The production of carbon black from carbon monoxide (1s. 6d.).

BIOS 1402. The German manufacture of certain inorganic pigments (20s.).

BIOS 1409. Cold Impact extrusion of aluminium, etc. (3s. 6d.).

BIOS 1412. Vinyl acetate, vapour phase process (2s. 6d.).

BIOS 1414. Hydrogen peroxide. Summary of investigations carried out at Leverkussen on synthetic methods. I.G. Farbenindustrie (3s.).

BIOS 1418. Manufacture and applications of polyvinyl alcohol (4s.).

BIOS 1430. E. Merck, Darmstadt: Hydrogen peroxide solution, perhydrol and perhydrit (urea hydrogen peroxide) (3s. 6d.).

BIOS 1432. Kalichemie, Honningen: Barium compounds, hydrogen, peroxide, sodium perborate, sodium percarbonate (3s.).

BIOS 1433. I.G. Farbenindustrie A.G. The manufacture of triphenylmethane dyestuffs at Hoechst, Ludwigshafen and Leverkusen (13s.).

BIOS 1446. Some targets of ceramic interest in the Berlin area (3s. 6d.).

FIAT 757. The production of potassium permanganate and manganese chloride. (s.)

FIAT 878. Melting and casting of German silver alloys (2s. 6d.).

FIAT 955. Special mechanical features of Linde-Frankl oxygen plants (4s. 6d.).

FIAT 984. Phthalic anhydride, manufactured at I.G. Farbenindustrie, Uerdingen. (2s.)

FIAT 1025. Production of acrylonitrile at Leverkusen (1s. 6d.).

FIAT 1049. Tartaric acid processes in Germany (1s. 6d.).

FIAT 1071. Chlorinated polyvinyl chloride (2s.).

FIAT 1088. Films of pure and mixed long chain dibasic esters. Report in German (2s. 6d.).

FIAT 1095. Vapour-liquid equilibria of binary hydrocarbon mixtures. Report in German (2s. 6d.).

BIOS/JAP/PR/668/9. Sources of phosphate for Japan (2s. 6d.).

BIOS/JAP/PR/1158. Economic controls in the Japanese coal industry (4s. 6d.).

BIOS/JAP/PR/1666. The rayon and synthetic fibre industry of Japan (30s.).

JIOA 15. Rammelsberg lead—zinc mine (1s.).

JIOA 20. Theodolite manufacture (1s.).

JIOA 80. Pierre Demart. Underground gasification of coal (1s.).

German Explosives. Recovery.—At the Allendorf chemical plant, Hesse, the installation of plant for the recovery of chemicals from explosives has recently been started. Capacity is to reach 200 tons per day in three months. The Aschau plant at Muehldorf in Bavaria is reported to be converting smokeless powder into nitrocellulose, suitable for lacquers and cements.

Technical Publications

The British Rubber Development Board has just published a further study of "Positex," the modified rubber latex with a reversed (positive) charge on the particles, in relation to the treatment with it of woollen and worsted yarns and fabrics. The reach, of which the results are described in considerable detail in this booklet, was carried out in the laboratories of the Wool Industries Research Association and this review by Dr. C. M. Blow is authoritative and supplies the latest data available.

* * *

Wild-Barfield Electric Furnaces, Ltd., are about to issue a booklet describing a newly developed atmosphere application in association with Paragen burners which, it is claimed, represents a noteworthy advance in the field of controlled atmospheres in the heat treatment of metals. The method has resulted in important reductions of scaling and decarburisation. A practical illustration will be given at the firm's stand at the Marine and Engineering Exhibition.

* * *

Scientific descriptions of some of a wide range of industrial chemicals—principally amines and amine derivatives—manufactured by Robinson Bros., Ltd., at West Bromwich and Oldbury, Birmingham, are provided in the booklet "Chemicals," just issued.

* * *

The technique of "commercialising scientific knowledge" has gained much ground through the activities of A.S.L.I.B. (the Association of Special Libraries and Information Bureaux), of whose meeting last year—to discuss industrial information services a full report (members 3s., non-members 4s.) has now been published by A.S.L.I.B. The papers and discussion reviewed from many angles, subjects such as the functions of an industrial information officer, the organisation of information services and the requirements of special libraries.

* * *

Protracted shortage having conferred on coal a scarcity value not greatly less than that of the more familiar precious minerals, there is a good deal to be said for detailed studies of conservation methods, of which "The Handling and Storage of Coal" produced by a special committee of the Ministry of Fuel and distributed free of charge by H.M.S.O., is a useful example. The booklet (Fuel Efficiency Bulletin No. 49) provides expert information on basic matters, such as stocking, measurement of coal stocks, segregation and blending.

An article which will command widespread interest—contained in the new issue of Philips Technical Review, Vol. 9 No. 2 (Philips Lamps, Ltd.)—is devoted to a detailed description of the electron microscope by Mr. J. B. le Poole, director of the Institute for Electronic Microscopy at Delft, who constructed the model described. It was completed in 1944 and used for one month and was then dismantled to prevent its capture by the enemy. After the liberation, it was re-assembled and put into use again. Electron beams can be refracted and focused by means of magnetic or electrostatic lenses using the terminology of the optical microscope and an image thereby obtained. Among the advantages conferred by the electron microscope discussed in the article, is the ability to get an electron diffraction pattern of an object or specimen which has been studied microscopically, thus obtaining easier identification of the materials under investigation. Several applications of this kind of the electron microscope are examined.

* * *

The leading article in No. 1 of the Sulzer Technical Review for the current year deals with the stability of water distribution in the forced-circulation heating surfaces of steam generators. The conditions under which certain disturbances will occur are deduced and formulated in simple mathematical terms, and an examination is made of the behaviour of a few specially important systems when affected by disturbances of distribution. The number contains a description of the Disintegrator developed by Sulzer Brothers for sewage clarifying plant. This machine reduces bulky screenings which can then be used in digesting tanks for the production of useful substances such as manure and methane gas. A further article deals with the influence of heat treatment on the hardness and structure of a chromium-silicon valve steel and describes research carried out in the Sulzer metallurgical laboratory.

Canada's Chemical Import from U.S.A.—Canadian imports of chemicals and allied products from the United States in 1947 have so far been exceeding similar imports at the same time last year, rising in the first four months of this year to $32,972,304 as compared with $27,853,972 in the same period last year. Included are $280,492 worth of coal-tar base or salt for dyes amounting to $370,437 pounds, 7650 worth of camwood and sumac and extract (1417 cwt.) and $235,735 of chemical composition for dyeing extract (1417 cwt.) as well as $927 iron and red liquor for dyeing (164 cwt.).

A CHEMIST'S BOOKSHELF

Powder Metallurgy: Principles and Methods. By Dr. Henry H. Hausner. New York. Chemical Publishing Co., Inc., Brooklyn, 2. 1947, pp. vii-298. $7.00.

Apart from numerous articles in the technical Press and a fairly long list of patent specifications, the powder metallurgist's library concerned specifically with this subject should now comprise three textbooks and two symposia: the former by Drs. Jones, Baëza and Hausner, and the two symposia issued respectively by the American Society of Metals in 1943 (Editor John Wulff) and by the Iron & Steel Institute, London, in 1947. The subject, in its widest implications, covers, of course, the domains of general metallurgy and physical chemistry which demand their own bibliography as well.

The work comprises (1) general data on powder metallurgy, including glossary, principles, manufacturing methods, powders commercially available, and comparison of sintered with fused materials; (2) graphs and tables on powder metallurgical methods, showing the effects of particle size, compacting pressure and sintering conditions, subsequent treatment, and of composition; (3) bibliography. An extensive list of journals noted in the bibliography, with abbreviations, together with a good index are included. References are up to end of 1945 and the glossary is taken from the American symposium. Under " Principles " are noted five different processes for production of a binary compound or mixture, together with graphs relating density, hardness, shrinkage, etc., with the various factors: particle size, pressure, and so forth. Part 2 on methods should form a useful work of reference, containing much information and including graphs and tables.

It contains also much hitherto unpublished data by the author. An example is on page 62, showing the effects of different types of copper powder on hardness of tungsten-copper compacts. Composition was 84 per cent tungsten, 15.5 per cent copper, 0.5 per cent nickel; compacting pressure 25 tons/sq. in., sintering temperature 1040° C., time 2 hrs., atmosphere, hydrogen. Five different bars of copper were A, reduced, fine; B, electrolytic, coarse; C, electrolytic, fine; D, electrolytic, light fine; and E, reduced, coarse. The chart shows Brinell hardness of the five bar materials forged, and the five annealed after forging. Highest hardness was in C forged (260), while the lowest was in E annealed after forging (198). In this latter category (annealed) C was somewhat harder than B, and very much harder than the other three. The bibliography contains over a thousand references, and would seem to be relatively complete, so far as journals are concerned, for there are practically no references to the long and rapidly growing list of patents. Sir Henry Bessemer's pioneer work on brass and bronze powders for paints, which he started in Baxter House, St. Pancras, in 1843 is, rather unaccountably, omitted. On the other hand, a large number of references are given from Russian journals, indicating a considerable amount of research in powder metallurgy in that country.

Caribbean Mission Recommendations

Among the recommendations of the Caribbean Commission and the West Indian Conference are some for utilising British Guiana's silica sand for a glass and bottle industry, manufacturing cement in Trinidad and Jamaica, and producing oil in commercial quantities in Barbados where arrangements are already being made to utilise supplies of natural gas. These developments, together with the exploitation of the mineral and forest resources of individual territories, will help to balance the economy of the West Indies, whose economic position at the end of 1946 was materially better than in 1939.

Celanese Expansion Programme

" The expansion of our plant facilities is continuing," reported Mr. Harold Blancke, president of the Celanese Corporation of America, recently. $17,441,361 have been expended during the first half of 1947, compared with $20,476,451 for the whole year 1946. Considerable portion of this expansion programme is nearing completion and should play an important part in the future growth of the company. Among the latest organic chemicals now being offered to industry by our company as a result of additional facilities installed at the Bishop, Texas, plant are methyl ethyl ketone, methylal and tetrahydrofuran.

Home News Items

Industrial Accident Prevention. — The Royal Society for the Prevention of Accidents is to hold a National Safety Congress at Brighton in October next on the occasion of its Silver Jubilee.

Oil Paints Specification.—British Standard Specification No. 929:1947, which relates to ready-mixed oil paints, has just been revised, and copies may be obtained from the British Standards Institution, 28 Victoria Street, S.W.1.

Visit to Engineering Exhibition.—At the invitation of the organisers of the Engineering and Marine Exhibition, the Institution of Chemical Engineers is to be entertained to lunch at the Exhibition on September 4. Members will receive free tickets of admission for the occasion.

Fire at Port Sunlight.—An air-tight store chamber containing 50 tons of barley, caught fire on Sunday last at the Port Sunlight works of Lever Brothers. The works' fire brigade, together with other employees of the firm, battled with the blaze all night and managed to bring it under control by Monday.

Record Output of Ironfoundries.—Output of iron castings in the second quarter of this year amounted to 714,787 tons, which is equivalent to an annual rate of production of 2.86 million tons. This, according to the Council of Ironfoundry Associations, is the highest output ever officially recorded and has been achieved in spite of shortages of skilled labour and essential materials.

Packaging and Sales Promotion.—The British Sales Promotion Association, which suspended its monthly discussion meetings during the war, is to resume them again on Tuesday, September 9, at 6.30 p.m. at the Charing Cross Hotel, London, W.C.2, when Dr. G. L. Riddell, Director of Research, Printing and Allied Trades Research Association, will give an address on "Efficiency in Packaging." Mr. Charles T. Howard, chairman of the Association, will preside.

"Shop Window" Displays for Scottish Chemicals.—The chemical industries of Scotland are to have a "shop window" in Edinburgh and eventually also in Glasgow, Dundee and Aberdeen as a result of a new effort by the Scottish Council (Development and Industry). The Council plans to stage a series of displays of which the first is to be given soon in Edinburgh. It is intended to create displays of general industrial interest in order to familiarise the Scottish people with the products of their own factories.

Steel Nationalisation.—The executive Committee of the Iron and Steel Trades Confederation in a unanimous resolution passed at its quarterly meeting demands the "full and immediate nationalisation of the iron and steel industry."

Works Visit.—The Manchester section of the Oil and Colour Chemists' Association plans to visit the works and laboratories of the Cromford Colour Company, near Matlock, and the Hopton Mining Company's barytes mine at Brassington, on September 19.

Celanese Factory Fire.—A fire which broke out at the British Celanese factory at Spandon, near Derby, last Sunday, and which engaged 100 firemen for several hours was confined to a building used for the storage of cellulose acetate. Three floors of the building collapsed.

British Insecticide to Save Uruguayan Herd.—A York aircraft left Heath Row Airport last week with a rush consignment of a new insecticide for Uruguay, where valuable beef herds are threatened by the blue tick, notorious disease carrier and one of the most deadly of all cattle parasites.

Metal Finishing Journal.—*Electroplating* is the title of a new technical monthly dealing with plating, anodising, enamelling, pickling, lacquering, bronzing, polishing and phosphating; the first issue will appear in November. The editor is Mr. C. R. Draper, and the subscription rate 37s. 6d. a year.

July Coal Figures.—The average weekly output of coal in July amounted to 3,332,200 tons (including 219,000 tons opencast). This is 519,100 tons less than was produced in the average June week and 159,100 tons below the figure for the corresponding period last year. Distributed stocks increased by 1¼ million tons. On August 3 there were 2.4 million tons more of distributed stocks in the country than at the same date last year. There were 800 more wage earners on colliery books than in June.

Chemicals Disposal Achievement.—By the end of June last the Pharmaceutical and Allied Chemicals Disposals Association, Ltd., had purchased on behalf of its members Government surplus stores to the value of approximately £165,000. The Association, which was formed in 1945 as a non-profit-making body to co-ordinate the sale and disposal of goods purchased from Government sources, has over 100 members, and expects to continue its activities until such time as Government stores are no longer offered, *i.e.*, until about March of next year.

Personal

LORD ASHFIELD, 73-year old deputy chairchairman of I.C.I., has been appointed by the Minister of Transport as a member of the British Transport Commission.

MR. PETER M. DEWAR, late chairman of John Dewar & Sons and a director of the Distillers Company, who died in June, left £388,919—net personalty £377,654

MISS W. G. KEEPE, Manchester, who has been engaged on penicillin research for the past year, has been awarded the Wellcome Pharmaceutical Research Fellowship for the academic year beginning in October.

DR. D. PARKINSON, chief of Dunlop's compounds division, has returned from an inspection of carbon black manufacturing plants in America. In the course of his tour Dr. Parkinson gave lectures to laboratory staffs in New York, Boston, Texas and Toronto, on the use of carbon black in tyre manufacture.

MR. H. HALLIDAY will to-morrow relinquish his appointment as director of Refractories in the Ministry of Supply.

DR. JAMES W. ILLINGWORTH, research textile chemist at Fort Dunlop, Birmingham, MR. NORMAN E. L. EYRE, in charge of the service laboratory of Messrs. Courtaulds, Ltd., and MR. J. L. F. MCDONALD, weaving supervisor of British Celanese, have been elected Fellows of the Textile Institute at a recent meeting of the Council of the Institute at Manchester.

"Shell" Appointments

MR. F. H. BRAYBROOK ("Shell" Chemical Products Department) with the assistance of MR. W. F. MITCHELL, will head the Management of Industrial Development recently formed to advise the "Shell" board of directors on worldwide technical developments insofar as they affect the petroleum and chemical industry. DR. W. S. MATTHEWS, formerly with I.C.I., Billingham, will be responsible for the Division of Industrial Development Planning, MR. A. V. BILLINGHAM and MR. L. W. LEYLAND COLE will be in joint charge of the Market Research Division, while the Patents Division will be directed by MR. A. D. KOELEMAN, until recently manager of the Patents Department of the N.V. Bataafsche Petroleum Maatschappij, Holland.

Obituary

Formerly an Assistant Comptroller in H.M. Patent Office, FRANCIS WILLIAM HODGES, aged 90, died at Wimbledon on August 21.

NEXT WEEK'S EVENTS

TUESDAY, SEPT. 2 to TUESDAY, SEPT. 9
Fuel Economy Conference of the World Power Conference, The Hague.

Princess Elizabeth

R.S.A.'s New President

H.R.H. The Princess Elizabeth has graciously accepted the invitation of the Royal Society of Arts to become its President. The Royal Family has been closely connected with the Royal Society of Arts for over a hundred years, Prince Albert having become the Society's President in 1843; it was in that capacity that he initiated the Great (Hyde Park) International Exhibition held in 1851. Other Royal Presidents have been their Royal Highnesses the Prince of Wales (later King Edward VII), The Prince of Wales (later King George V), and The Duke of Connaught. The Society, which is the third oldest of the learned societies in Britain, will shortly prepare to celebrate its second centenary in July, 1954.

Purchasing Agency in Germany

The Director of the British Purchasing Agency (Germany) has announced that a branch office for Nord-Rhein/Westfalen has been established at rooms 411/412 Steel House, Dusseldorf, where it is hoped all British commercial visitors needing information or assistance in the conclusion of export purchase contracts from the land will call. Where practicable, every assistance will be rendered to them, including the provision of personal contacts with manufacturers if desired.

The head office of the British Purchasing Agency (Germany) remains at Minden until further notice, and all correspondence in regard to exports from Germany to the United Kingdom should continue to be addressed to that office.

Novel Carton

An interesting feature at the Enterprise Scotland 1947 Exhibition, now being held at Edinburgh, is a pump carton which combines a container and a pump device. The pack, which has been made by John Laird & Son, Ltd. for George Munro's insect powder, consists of two sections, one containing the powder and the other housing a concertina air space.

Understood to be suitable for liquids and powders alike, the carton may supersede the separate spray and thus greatly simplify dusting and spraying.

Whaling Agreement

By international agreement, only seventeen whaling factory ships will sail for the Antarctic when the whaling season opens there next December. Britain's quota is three, the remainder being allocated as follows: Norway nine, Japan two, and Russia, South Africa and Holland one each.

Overseas News Items

No British Alkalis for Australia.—Because of the fuel shortage, Britain will not be in a position to supply Australia with soda ash and caustic soda in the current year.

New U.S. Insecticides.—Tetraethyl pyrophosphate and hexaethyl tetraphosphate, should be available next year after field tests have been completed this summer.

African Sodium Carbonate.—Kenya and Uganda, forming a single statistical unit, in 1946 produced 78,000 tons of sodium carbonate from Lake Magadi near Nairobi.

Further French Chemical Price Increases.—The prices of copper sulphate and of sulphur in France are shortly to be increased. Both commodities are important to France's agriculture.

U.S. Industrial Production Down.—Industrial production in the United States declined in June and the downtrend continued in the early part of July, reports the U.S. Federal Reserve Board's monthly summary of business conditions.

Malayan Tin Exports.—Malayan in shipments during July totalled 3955 tons as against 3289 tons during the previous month. Disposal was as follows: U.S.A. (3500), U.K. (105), European Continent (260), British possessions (90).

Carborundum Co. Expansion.—The Carborundum Company, Niagara Falls, has decided on an extensive expansion programme which will eventually involve an expenditure of more than fifty million dollars.

Czechoslovak Soap Industry.—Czech soap factories plan to produce 30 million cakes of soap and 7 million kilogrammes of washing powder in the quarter ending in September. This should make it possible to increase the present small ration—one 100 gramme cake a month.

Higher Brazilian Imports of British Chemicals.—The value of British chemicals imported to Brazil in May aggregated about £120,000, *i.e.* twice the amount of the previous month. She also substantially increased her imports of British non-ferrous metals.

French Chemical Prices Up.—The French Price Administration Office has increased the price for sulphuric acid (20 per cent oleum) from 358.2 francs to 431 francs per 100 kilogramme, the price of pyrites has been raised from 2050 to 2400 francs per metric ton, while the price of superphosphate and of ground phosphates has also gone up. The price for glass has been increased by some 20 per cent.

Spanish Chemical Developments.—The manufacture of cyanamide is to be taken up in Santander Province by the Union Quimica del Norte de España.

U.S. Nylons for Turkey.—A U.S. firm is reported to have agreed to supply 200,000 pairs of nylon stockings to the Turkish market.

U.S. Company to Close.—The Langeloth, Pa., plant of American Zinc and Chemical Company may soon be closed because it uses an obsolete process for the production of non-ferrous metals.

Strikes in Chile.—Production of nitrate, copper and coal in Chile has fallen off recently as a result of strikes. The Chilean president imputed communist inspiration and has sacked three ministers.

France to Build Sugar Factory in Chile.—A proposal made by French interests to set up a sugar-beet factory in Chile has been approved, and work is expected to commence in November with machinery imported from France.

Turkey Requires Reconstruction Loan.—The Turkish Government is understood to be preparing to apply to the World Bank for a 400 million-dollar loan. This credit is urgently needed for reconstruction of industry and agriculture.

European Coal Production Increase.—There was an increase of nearly 2,000,000 metric tons of coal in July from European countries compared with June. Production was 19,263,000 metric tons against 17,507,000 metric tons in June.

Postal Despatch of Penicillin to Germany Prohibited.—The British and American health authorities in Germany have banned the private import of penicillin by post in order to reduce the black market and to make self-treatment of the Forces and others more difficult.

Chilean Nitrate Prices Higher.—Owing to increased labour and transport costs, the price of Chilean nitrate has risen by $4 a ton. The Chilean Nitrate Sales Company is now quoting $42.50 a ton for nitrate fertilisers in bulk, and $45.50 a ton in bags of 100 lb. each.

Swiss-Hungarian Deal.—A Swiss textile manufacturer, Mr. J. Dainicker, and a representative of the Swiss iron industry, Mr. Kunz, managing director of the Von Moos Iron Works, have visited Hungary to explore the possibilities of finishing work on a hire basis. Trade between Hungary and Switzerland is developing satisfactorily and barter has already exceeded the agreed quantities.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

Satisfaction

FLEETWOOD CHEMICAL CO. LTD., (old co.), London, S.E. (M.S. 30/8/47). Satisfaction July 16, of charge registered September 12, 1946.

Company News

The nominal capital of **Boots Pure Drug Company Ltd.** has been increased beyond the registered capital of £3,000,000 by £1,000,000, in 4,000,000 ordinary shares of 5s.

The nominal capital of **Miles Laboratories Ltd.**, 12 Whitehall, London, S.W.1, has been increased beyond the registered capital of £10,000, by £40,000, in £1 shares.

The name of **Delanium Ltd.**, 140 Battersea Park Road, London, S.W.11, has been changed to **Powell Duffryn Research Laboratories, Ltd.**, as from June 25, 1947.

The name of **Wilsons (Bradford), Ltd.**, 5 Godwin Street, Bradford, has been changed to **Wilsons Chemical Products Limited** as from June 25, 1947.

The name of **Newcastle-upon-Tyne Zinc Oxide Company Ltd.**, 66 John Street, Sunderland, has been changed to **Durham Chemicals Limited** as from July 1, 1947.

The nominal capital of **Thornton and Ross Ltd.**, manufacturing chemists, etc., Linthwaite, Huddersfield, has been increased beyond the registered capital of £7000 by £3000, in £1 ordinary shares.

The name of **Cross and Max (Agencies), Ltd.**, chemicals, etc., 17-18 Bishops Court, Old Bailey, London, E.C.4, has been changed to **Cross and Max, Ltd.**, as from June 28, 1947.

Metal Traders Ltd. has announced a profit for the year ended March 31 of £78,073, a figure which compares with £9545 for the previous year. A final dividend of 212½ per cent is recommended, making a total of 250 per cent for the year.

The nominal capital of **Genatosan Trust Ltd.**, Harvest House, Ipswich, has been increased beyond the registered capital of £1,297,150 by £1,000,000, in £1 3¾ per cent cum. red. pref. shares. The capital is now £2,297,150 in 1,000,000 red. pref. shares of £1 and 2,594,300 ordinary shares of 10s.

On September 19 **Borax Consolidated** will pay an interim dividend on the £1,500,000 deferred ordinary stock of 4 per cent less tax in respect of the year ending September 30. This is the first interim dividend for some years. Last year's distribution was 10 per cent less tax, and included a 2½ per cent bonus.

O-Cedar Ltd. polish manufacturers is to raise the dividend on its "A" and "B" shares for the year ended March 31, from 50 per cent to 60 per cent (less tax). The year's profits amounted to £31,323 as compared with £31,759 in the previous year. Net profits for the same two years were £11,323 and £7156 respectively.

New Companies Registered

Aralkyl Chemicals Ltd. (440,962).—Private company. Capital £1000 in £1 shares. Subscribers: L. Jackson, C.A., and N. E. Ollis, L. Jackson is the first director. Registered office: 10 Bedford Street, W.C.2.

Claredene Trading Company Ltd. (440,974).—Private company. Capital £1000 in £1 shares. Importers and exporters of and dealers in foodstuffs, chemicals, machinery, textiles, leather goods, etc. Directors: K. Lawton and G. Lawton. Secretary: W. F. Radford. Registered office: 44 Bedford Row, W.C.1.

Moray Chemical Products Ltd. (440,031).—Private company. Capital £20,000 in 20,000 shares of £1 each. Soap manufacturers, pharmaceutical, manufacturing and general chemists and druggists, etc. Subscribers: H. Mishon, and A. Kennedy. Solicitors: Billinghurst, Wood and Pope, 7 Bucklersbury, E.C.4.

Brennan Developments Ltd. (441,032).—Private company. Capital £6000 in £1 shares. Manufacturers, producers, designers, assemblers and repairers of and dealers in gas discharge and fluorescent tubes, fluorescent chemicals, electric lamps, gas discharge and fluorescent signs, etc. Subscribers: E. Hunter and C. Chudleigh. Secretary, E. Hunter. Registered office: 206 Grove End Gardens, Grove End Road, N.W.8.

Simonswood Manufacturing Co. Ltd. (441,022).—Private company. Capital £20,000 in £1 shares. Chemical manufacturers, glass manufacturers, engineers, motor manufacturers, timber merchants, china and pottery manufacturers, rubber and plastic manufacturers, textile and paper manufacturers, and various other businesses. Subscribers: F. H. Carlin and A. Walmersley. Registered office: Ashcroft Road, Kirby Trading Estate, Kirby, near Liverpool.

Chemical and Allied Stocks and Shares

EARLIER in the week, stock markets were subdued, with business in most sections declining further, buyers holding off pending news of the Government's crisis measures. British Funds made further headway, fixed interest bearing stocks being in better demand, but in contrast industrial shares remained dull in the absence of buyers, although some of the leading shares continued to attract attention as a hedge against the danger of increased inflation. Moreover, sentiment was affected by fears that for the present, the non-convertibility of sterling may lead to contraction in international trade.

Chemical shares were generally steady, and Imperial Chemical at 45s. rallied moderately, partly because of the group's big interest in home and export trade. Moreover, the £100 million plan for agricultural expansion and development should lead to growth in demand for some classes of chemicals, fertilisers, etc. Fisons have been relatively firm for a similar reason, business again being around 60s. Elsewhere, B. Laporte were 92s. 6d., and W. J. Bush marked 87s. 6d. Monsanto Chemicals 5s. shares changed hands around 51s. 6d., and Greeff-Chemicals 5s. shares were 15s. 3d. In other directions, Turner & Newall declined, but later made a small rally to 74s., but United Molasses were down to 47s. 9d., and the units of the Distillers Co. fell sharply to 131s. 3d. despite the impending consolidated accounts and final dividend. British Plaster Board were down to 24s. 9d. and Associated Cement 66s., reflecting fears of slowing down of the building programme. Lever & Unilever eased to 50s., but Lever N.V. strengthened to 46s. 9d. British Glues & Chemicals 4s. ordinary were 19s. 9d. or within 3d. of the level a week ago. General Refractories were 22s., and in other directions, Amalgamated Metal firmed up to 16s., attention being drawn to the favourable yield and to hopes that the London Metal Exchange may reopen next year. Imperial Smelting were 18s. 6d., British Oxygen 90s., and British Aluminium became firmer at 42s. on the company's strong position and the probability that demand for aluminium will continue to increase.

Iron and steels have been steadier, despite the latest news of trade union requests for early nationalisation. Guest Keen rallied to 43s. 3d., and Stewarts & Lloyds became firmer at 48s. 3d., but on the other hand Tube Investments gave ground at £6 3/16, and Allied Ironfounders were no better than 51s. 6d. Ruston & Hornsby strengthened to 60s., and shares of other companies making tractors and agricultural equipment also received some attention. Triplex Glass at 29s. regained part of an earlier decline. The better tendency in textiles, which recently developed, was not maintained, but price movements were small and unimportant. Calico Printers were 20s. 6d. awaiting the dividend decision, Bradford Dyers 21s., and Bleachers 10s. 7½d., Borax Consolidated deferred at 50s. remained unaffected by the decision to initiate interim dividends, although this presumably indicates that the level of profits is good and holds out the possibility of a higher total payment for the year.

Elsewhere, Boots Drug were 56s. 3d., Sangers 34s. 6d., Griffiths Hughes 45s., and Beechams deferred 22s. 6d. Oil shares have receded in the absence of demand. Iranian became steadier at £9, Burmah Oil were 81s. 3d., Lobitos 67s. 6d., and Shell 95s. 7½d., but preference shares of the leading companies made higher prices.

British Chemical Prices

Market Reports

MANCHESTER.—Holiday influences have been rather less in evidence on the Manchester chemical market during the past week and new business in the alkalis and other heavy products has been on a fair scale. This has included both home and export buying. Contract deliveries are being called for steadily, but there is considerable difficulty in the case of certain materials for allocations to keep abreast of requirements, especially in soda ash and other chemicals. In fertilisers a moderate trade has been reported. There has been little change in the position of the tar products, the majority of which are being taken up to the full extent of the quantities available.

GLASGOW.—In the Scottish chemical market during the past week, business has been fairly active. There is a large unsatisfied demand for chemicals for the paint trade, *viz.*, zinc oxide, white lead, lithopone and white barytes. The demand for extra supplies of soda ash and caustic soda for industries on essential business continues unabated. There are no signs of an improvement in the supply position of Glauber salts and trisodium phosphate. All chemicals available have been absorbed without difficulty. In the export market, inquiries are still numerous and a regular percentage of orders is still being booked. Demand from the Argentine has been noteworthy, and it seems likely that this market will be adversely affected by the sterling restriction.

Patents in the Chemical Industry

The following information is prepared from the Official Patents Journal. Printed copies of specifications accepted may be obtained from the Patent Office, Southampton Buildings, London, W.C.2., at 1s. each.

Complete Specifications Open to Public Inspection

Manufacture of vat dyestuffs.—Ciba, Ltd. February 1, 1946. 3034-35/1947.

Manufacture of reducing agents and dyestuff preparations containing them.—Ciba, Ltd. February 1, 1946. 3036/1947.

Selective calcination of dolomite.—Dorr Co. November 3, 1945. 18065/1947.

Mordanting dyestuffs.—E.I. Du Pont de Nemour & Co. January 31, 1946. 2240/1947.

Preparation of peracids.—E.I. Du Pont de Nemours & Co. February 5, 1940. 18431/1947.

Ceramic composition.—General Motors Corporation. February 1, 1940. 18218/1947.

Hydrocarbon liquid containers.—Glenn L. Martin Co. April 1, 1942. 18132/1947.

Catalyst manufacture.—Houdry Process Corporation. January 30, 1946. 1107-10/1947.

Process of hydrocarbon conversion.—Houdry Process Corporation. January 30, 1946. 1231-32/1947.

Thermochemical scarfing method and apparatus.—Linde Air Products Co. January 31, 1946. 1704/1947.

Apparatus for dispensing liquefied gases.—Linde Air Products Co. January 31, 1946. 1705/1947.

Method of preparing methyl *p*-vinyl benzoate and the improved methyl *p*-vinyl benzoate and its acid derivative *p*-vinyl benzoic acids resulting therefrom.—Monsanto Chemical Co. February 1, 1946. 2106/1947.

Stabilisation of soap.—Monsanto Chemical Co. April 25, 1940. 17994/1947.

Processes of producing condensation products, and the improved condensation product resulting therefrom, and processes of preserving rubber and the vulcanised rubber products resulting therefrom.—Monsanto Chemical Co. December 22, 1945. 18270-71/1947.

Method of making a chemical product and the improved chemical product resulting therefrom.—Monsanto Chemical Co. July 26, 1940. 18272/1947.

Manufacture of alkylic ethers of glycols.—Montecatini, Soc. Generale per l'Industria Mineraria E. Chimica. October 5, 1942. 18303/1947.

Process for the production of halogenated fatty acids.—Mo Och Domojo A/B. January 31, 1946. 2527/1947.

Solvent extraction of glyceride oils.—Pittsburgh Plate Glass Co. January 17, 1939. 18137/1947.

Hydrolysis of organic esters.—Soc. Normande de Produits Chimiques. January 29, 1946. 10930/1947.

Manufacture of alkali chlorites starting from chlorine dioxide.—Solvay & Cie. January 31, 1946. 567-8/1947.

Wetting agents, detergents and emulsifiers.—Standard Oil Development Co. November 12, 1938. 18007/1947.

Separation of isobutylene from hydrocarbon mixtures.—Standard Oil Development Co. November 19, 1938. 18008/1947.

Alkylated thiophene compounds and production thereof.—Texaco Development Corporation. February 1, 1946. 2104/1947.

Alloy and an article of manufacture made therefrom.—Timken Roller Bearing Co. February 26, 1941. 18139/1947.

Pigment compositions.—American Cyanamid Co. January 25, 1946. 444/1947.

Lubricating compositions and process of preparing same.—American Cyanamid Co. January 26, 1946. 520/1947.

Lubricating compositions and process of preparing same.—American Cyanamid Co. January 26, 1946. 521/1947.

Production of heat insulating materials.—British Celanese, Ltd. January 23, 1946. 32264/1946.

Manufacture of synthetic resins.—British Celanese, Ltd. January 26, 1946. 1509/1947.

Process for the manufacture of thioglycolic acid or its salts.—G. Carpeni, and P. Souchay. January 24, 1946. 34102-3/1946.

Carbon black.—Columbian Carbon Co. January 28, 1946. 3127/1947.

Catalytic endothermic reactions, and in particular to the production of hydrocyanic acid.—E.I. Du Pont de Nemours & Co. October 9, 1945. 30112/1946.

Electrolytic processes.—E.I. Du Pont de Nemours & Co. January 23, 1946. 2116-17/1947.

Plastic materials and methods of production thereof.—E.I. Du Pont de Nemours & Co. January 25, 1946. 2261/1947.

Bleaching of wood pulp.—E.I. Du Pont de Nemours & Co. January 24, 1946. 14421/1947.

Production of butadiene.—Koppers Co., Inc. January 24, 1946. 30022/1946.

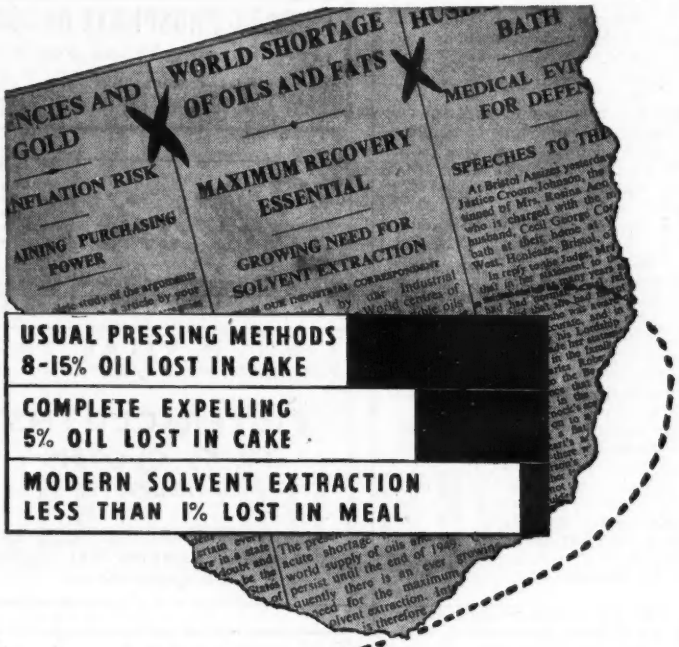
Process for producing polyhydric alcohols, or ethers thereof. Mo Och Domojo A/B. October 13, 1945. 29709/1946.

Organic lubricating composition.—N.V. de Bataafsche Petroleum Maatschappij. January 23, 1946. 1265/1947.

Lubricating compositions.—N.V. de Bataafsche Petroleum Maatschappij. January 25, 1946. 1266/1947.

Bituminous compositions.—N.V. de Bataafsche Petroleum Maatschappij. January 26, 1946. 2054/1947.

(*Continued on page* 312)



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Process for the manufacture of dispersions of reaction products of high molecular weight from di-halogen hydrocarbons and polysulphides.—N.V. de Bataafsche Petroleum Maatschappij. July 15, 1941. 17756/1947.

Process for the manufacture of concentrated stable aqueous dispersions of reaction products of di-halogen alkanes with polysulphides.—N.V. de Bataafsche Petroleum Maatschappij. January 3, 1942 17757/1947.

Process for the manufacture of amino ethers.—Parke, Davis & Co. April 18, 1944. 17917/1947.

Process of producing chlorites from chlorine dioxide.—Solvay & Cie. Dec. 15, 1945. 32538/1946.

B-aminopropionitriles and method of producing same.—American Cyanamid Co. January 8, 1946. 38126/1946.

Beater constructions. — American Cyanamid Co. February 5, 1945. 17009/1947.

Process for manufacturing of vinylesters of carboxylic acids.—Bata, Narodni Podnik. September 15, 1941. 16833/1947.

Process for producing high molecular polyamides.—Bata, Narodni Podnik. September 15, 1941. 16834/1947.

Process for concentration of acetic acid, eventually elimination of water therefrom. —Bata, Narodni Podnik. October 16, 1941. 16835/1947.

Process and device for producing lactams. —Bata, Narodni Podnik. December 5, 1941. 16836/1947.

Process of producing oximes.—Bata, Narodni Podnik. March 26, 1942. 16837-38/1947.

Process and device for producing lactams. —Bata, Narodni Podnik. May 12, 1942. 16840/1947.

Method of isolating cyclic lactams.—Bata, Narodni Podnik. September 24, 1942. 16841-42/1947.

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(d) Two for development work with experience of semi-scale operations.

(e) Others for analytical work by both chemical and physical methods and to assist in research into new methods.

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